34th Year NOVEMBER, 1950

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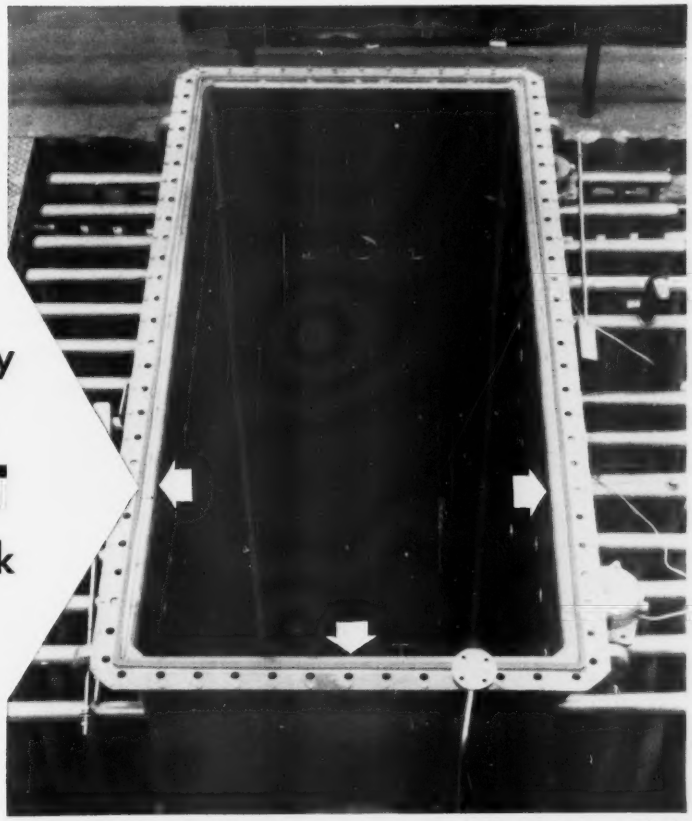
Another development using

B. F. Goodrich Chemical Company *raw materials*

Revolutionary transformer **GASKET** does the work of three!



B. F. Goodrich Chemical Company does not make this gasket. We supply the raw materials only.

YOU'D have to search far to find a transformer gasket that does the job as well as the Hycar nitrile rubber one pictured here.

First of all, this gasket effectively resists any deteriorating effects of the hot insulating liquid which circulates in the transformer. Hycar OR-15 is the only elastomeric material that has been approved for this service.

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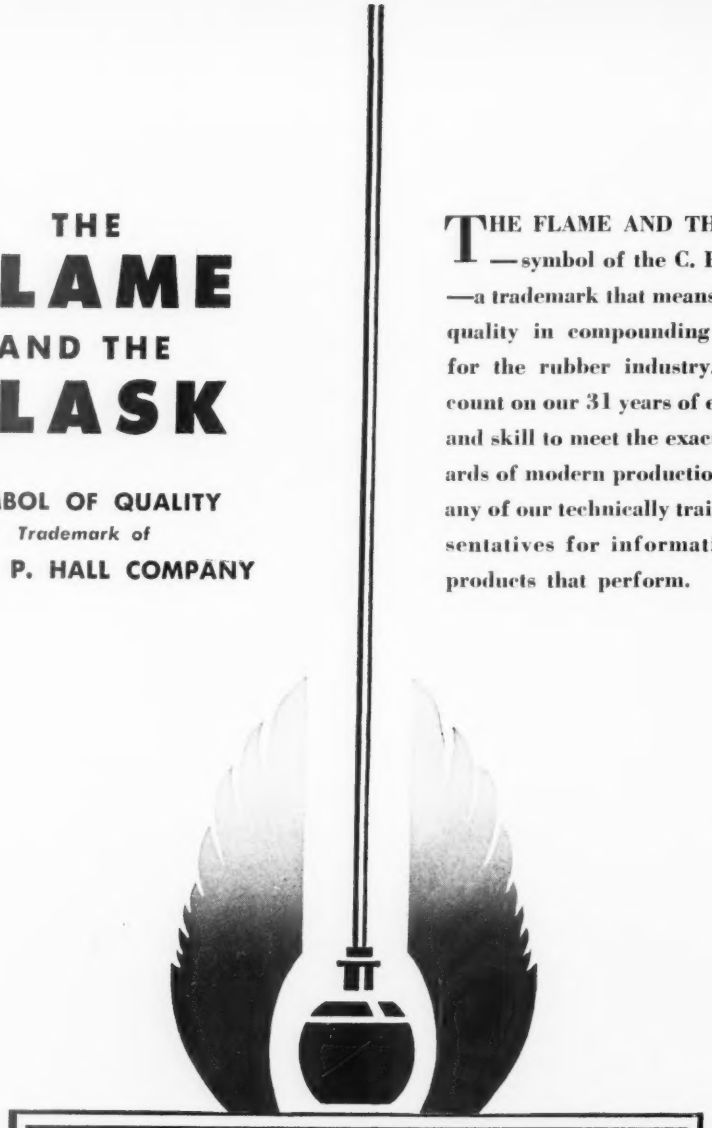

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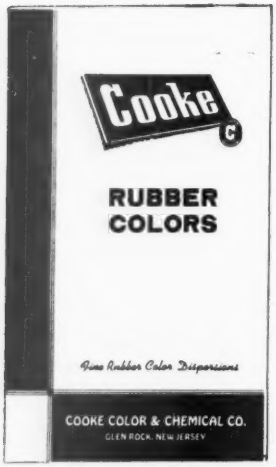

Above is shown the cover of our new Color Chart. If you have not received a copy, send for it today. It gives you actual colored rubber samples in more than 20 basic shades which can be blended to get the exact tone you require.

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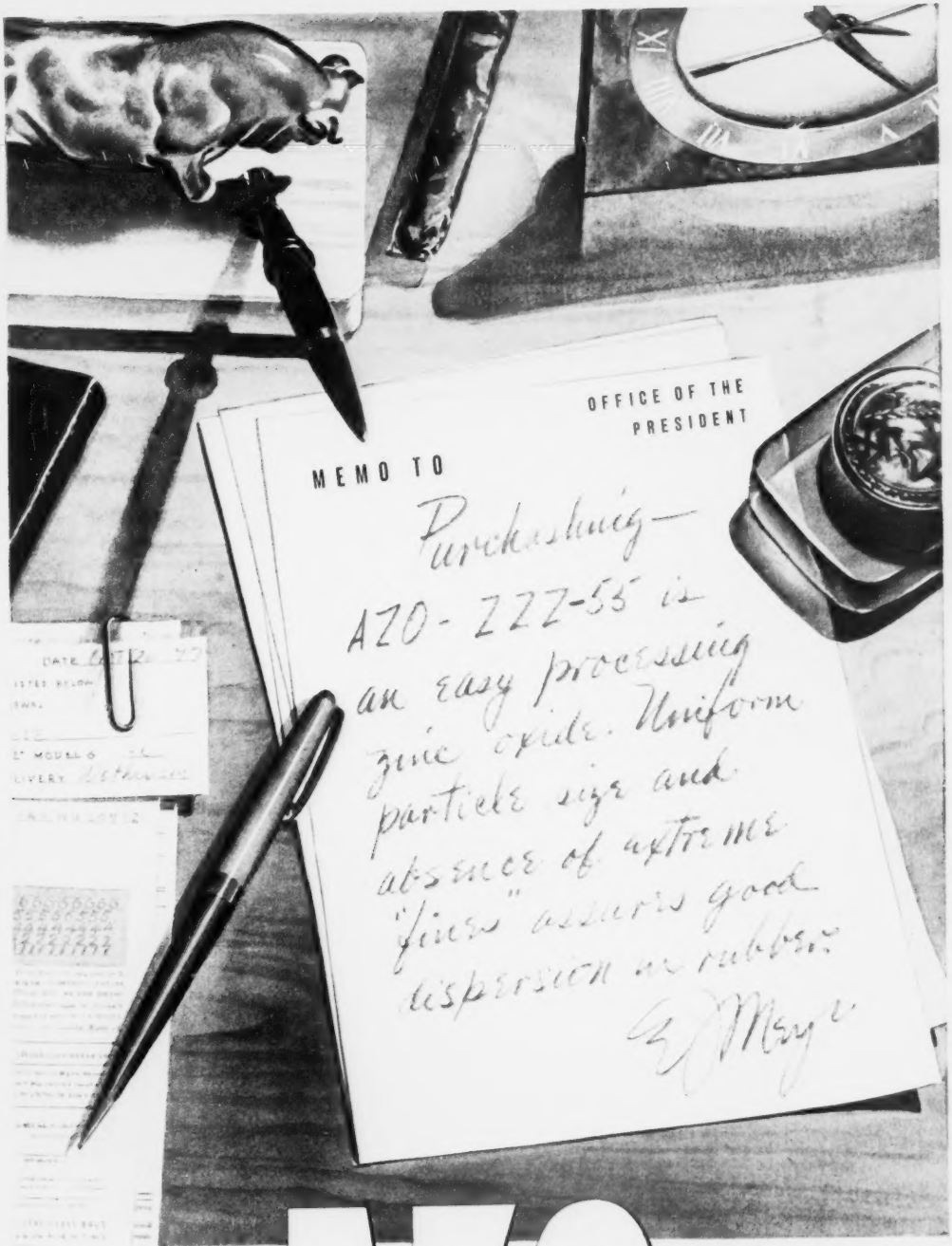

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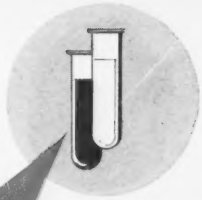

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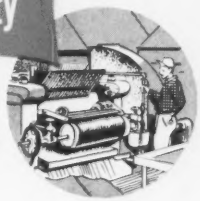
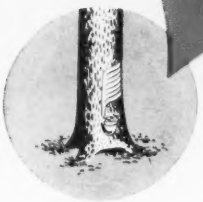
cuts costs, improves quality



for Reclaimed Rubber



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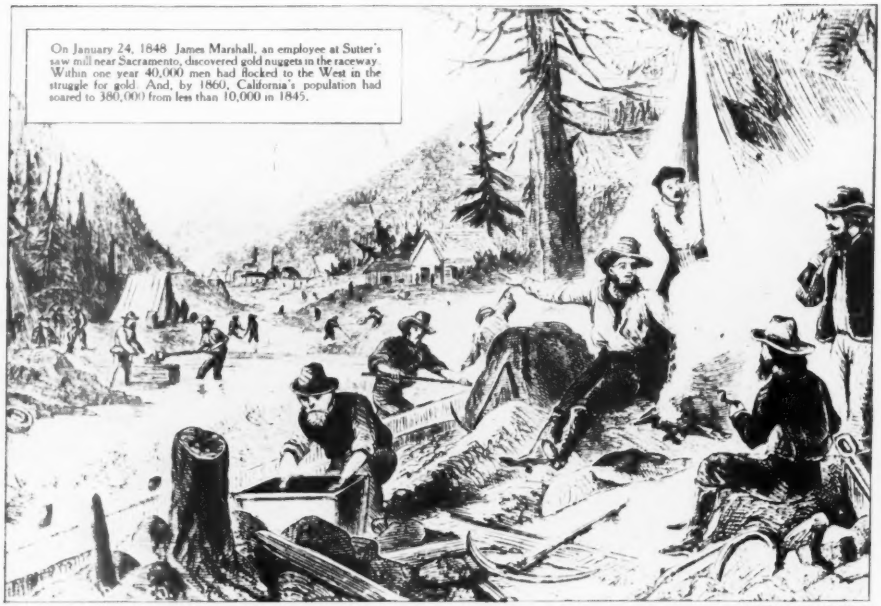
On January 24, 1848 James Marshall, an employee at Sutter's saw mill near Sacramento, discovered gold nuggets in the raceway. Within one year 40,000 men had flocked to the West in the struggle for gold. And, by 1860, California's population had soared to 380,000 from less than 10,000 in 1845.

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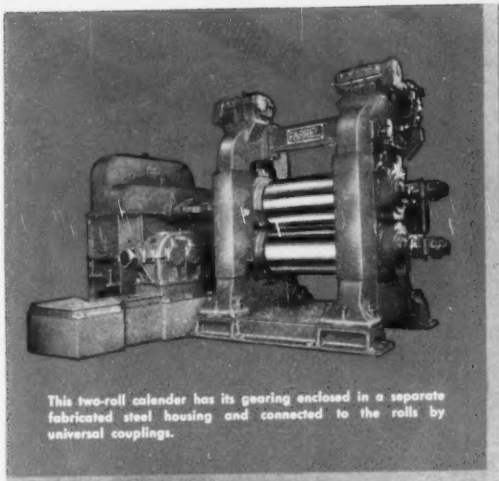
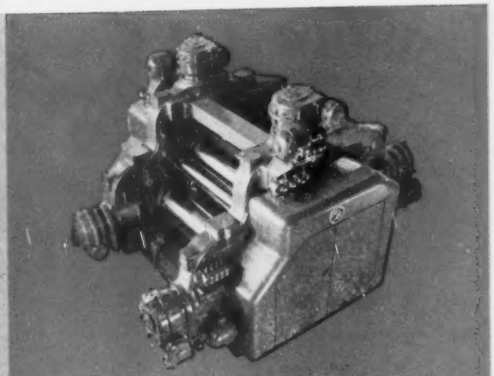
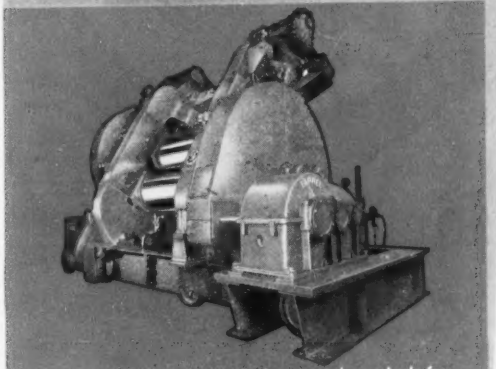


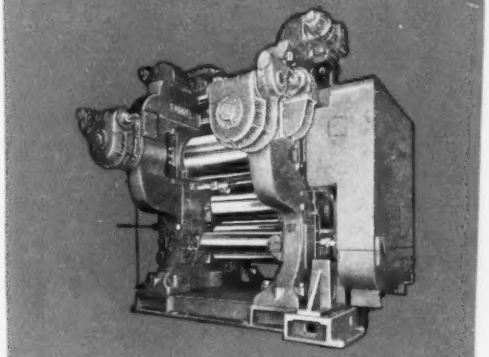
This two-roll calender has its gearing enclosed in a separate fabricated steel housing and connected to the rolls by universal couplings.



New four-roll Z-type calender with built-in device for crossing the roll axes to compensate for roll deflection. Hydraulic pullbacks eliminate backlash and hold the rolls firmly in their operating positions.



Two-roll inclined linoleum calender mounted on wheels for roll travel from oven to oven, with individual right angle motor drive for each roll, and individual motor adjustment for each screw of top roll.



In this four-roll calender, adjustment of rolls is by individual motor. Push-button control provides for adjustment of either roll end separately or both together.

WHAT IS NEW IN CALENDER DESIGN?

In the last few years, Farrel-Birmingham has been responsible for many developments in the design of heavy equipment used in initial processing of rubber and plastics. New machines have been brought out, and conventional types have been modified and improved to meet changing requirements.

Among recent refinements in the design of calenders are:

1. Precision sleeve bearings with hydraulic pullbacks for holding rolls in positive operating position.
2. Improved lubrication system which provides for rapid circulation and cooling of oil to roll neck bearings.
3. Improved oil seals which retain oil in boxes and prevent contamination of stock.
4. Rolls drilled for more effective temperature control.
5. A built-in device which provides means for crossing the roll axes to compensate for deflection.
6. Roll adjusting mechanisms that permit finer adjustment of either roll end separately or both together.
7. Drive and connecting gears removed from calender and enclosed in a separate housing.

In addition to refinements such as these, great strides have been made in designing housings, journal boxes and other parts of the proper materials, proportions and weights to withstand the stresses and strains encountered in processing a wide variety of stocks at higher speeds.

When you need a calender, why not ask Farrel-Birmingham engineers to make recommendations. Their extensive experience in designing calenders for all kinds of uses is invaluable in selecting the right machine for any specific purpose.

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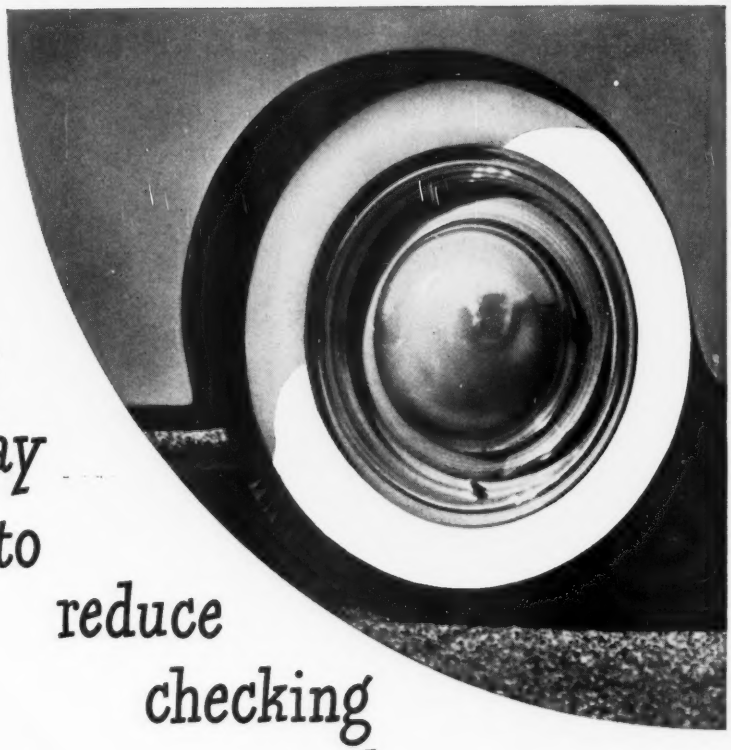

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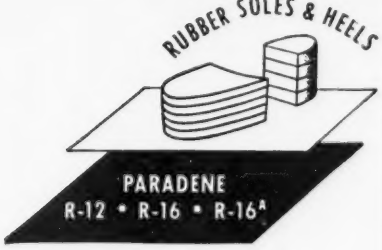

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The coumarone resins are used in the manufacture of rubber soles and heels to reduce set and leatherize the compounds. They are extender-plasticizers which do not lower hardness, tensile, modulus or tear. The grades used generally are medium high melting points and of light to dark color, depending on the color of the stock.

The most popular grades, in order of lightest color first, are R-13, R-14, R-15, R-16 and R-16A, and the low cost, quite dark Paradene #2. These resins are also used as extender-plasticizers in compounding the new plastic-type soles.

Why not call on Neville's years of research and experience for help on your rubber production problems?

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Chemicals for the Rubber Industry

R-42

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Yes, you will profit, as have many others, if you write to EEMCO for their proposition on Rubber and Plastics Processing Machinery. Engineered right, built right and of best obtainable materials you are assured of longer life and better production when you select EEMCO. If your present or future needs include any of the machines listed below, write EEMCO for a quotation. You will like their attractive prices and quicker deliveries. Standard and custom made, of course.

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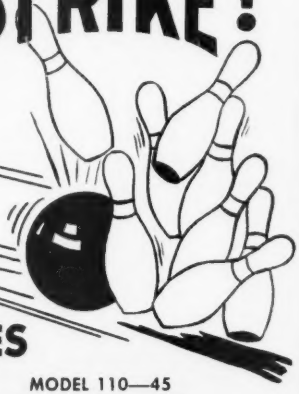

IN BOWLING,
WHEN A PLAYER MAKES
THREE CONSECUTIVE STRIKES, HE IS
SAID TO HAVE MADE A "TURKEY." WE AT
McNEIL HAVE ALSO MADE A "TURKEY" IN THESE THREE
MODELS OF OUR

MECHANICAL GOODS PRESSES

MODEL 800—24x24
HEAVY DUTY TWIN

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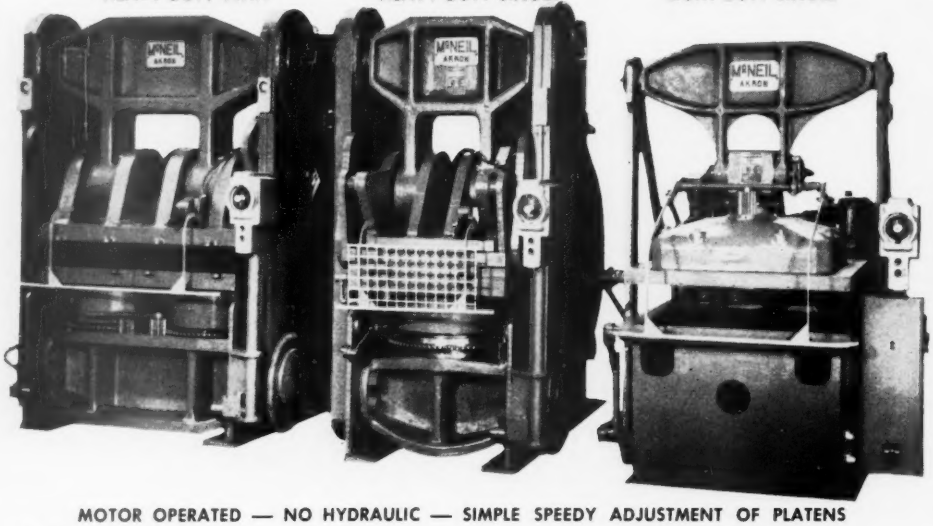

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- 800,000 pounds total pressure
- Two 24" x 24" drilled platens Individually adjustable 1" minimum—6" maximum
- 700 pounds per square inch platen pressure
- Adjustments for mold loadings—zero to 200 tons each mold position
- Two 24" x 24" molds may be used in same or different thicknesses or one 24" x 48" mold

- 800,000 pounds total pressure
- 32" x 32" drilled steam platens
- 780 pounds per square inch platen pressure
- Adjustments of mold loadings—zero to 400 tons
- Range of mold thickness, 1" minimum to 5" maximum or 2" minimum to 6" maximum

- 110,000 pounds total pressure
- 40" x 40" drilled steel steam platens
- 70 pounds per square inch platen pressure
- Adjustment of mold loadings—zero to 55 tons
- Range of mold thickness, 4" minimum to 9" maximum

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with increased fillers or extenders can help maintain production without loss of quality.

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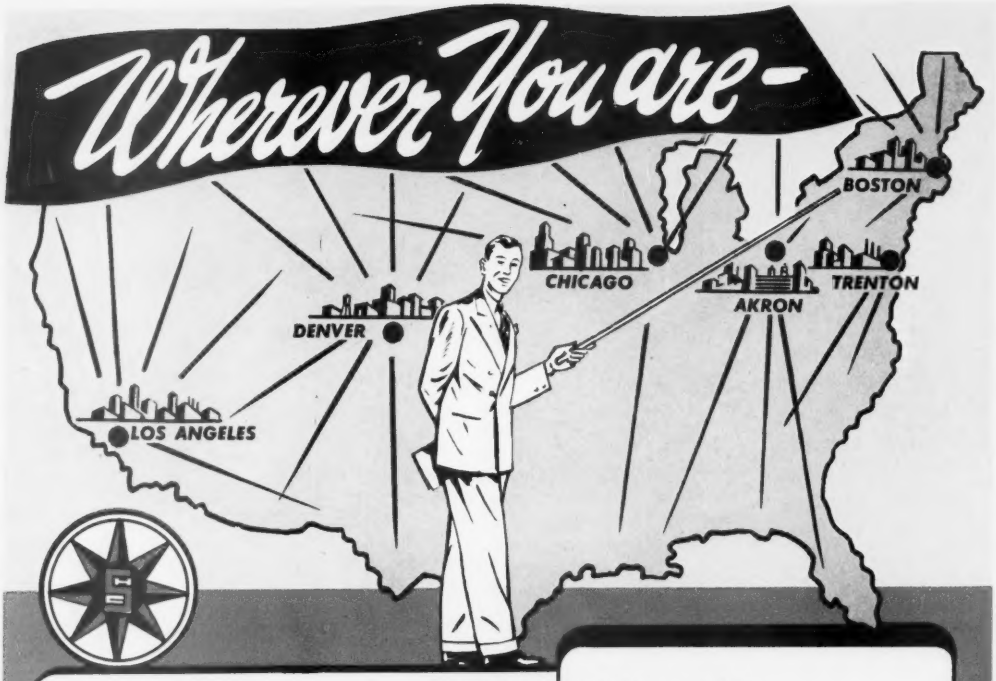

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There are technical representatives in the Harwick Standard Chemical Company's nation-wide organization strategically placed in areas of industrial concentration . . . These men skilled in the know-how of compounding—and provided with branch offices and warehouse facilities — can give you prompt and helpful service on problems of compound development and material supply . . .

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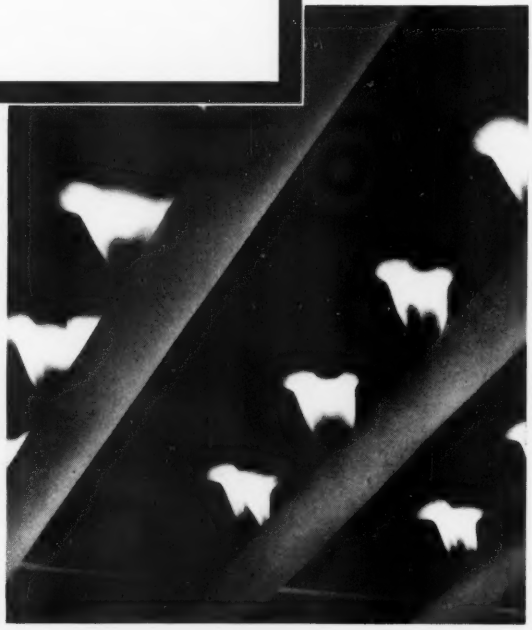

United channel blacks conform with your needs and with those of the times.

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Important news for all Rubber Processors:

GENERAL ELECTRIC

announces new high strength

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Once again, General Electric leadership in the development of new silicone rubber compounds brings you a profitable new line of materials to help you make better—and different—products than ever before.

Here's how YOU benefit—by:

- **Ease in processing; excellent molding and extrusion properties after only a five-minute warm-up time.**
- **Neutral stocks which you can color yourself create preference for your fabrication.**
- **Elimination of oven cure in fabrication of many parts.**
- **Outstanding hot tear strength; parts with undercuts easily removed from molds.**

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- **Obtaining parts with high tensile, high elongation, high tear strength, and excellent electrical properties at high and low temperatures (550 F. to —85 F.)**
- **Obtaining parts heretofore impractical with other silicone rubbers—improving product appearances.**

The General Electric silicone rubber laboratory is the most completely staffed and equipped in existence. To its facilities have been added new and expensive equipment which permits G.E. to duplicate precisely conditions in *your* plant. This is your assurance of high quality products and technical information which will fit your business exactly.

For more information about this remarkable new line of G-E silicone rubber compounds, just write to Section J3, Chemical Department, General Electric Company, Pittsfield, Massachusetts. (In Canada, Canadian General Electric, Toronto.)

Silicones for Industry

GENERAL ELECTRIC

The design and manufacture of processing rolls has been a highly specialized division of our business for more than 30 years.

Close co-operation with industry has given us an intimate knowledge of production problems and enabled us to make many important contributions to the development of modern, more efficient processing machinery.

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RUBBER & PLASTICS MACHINERY BULLETIN

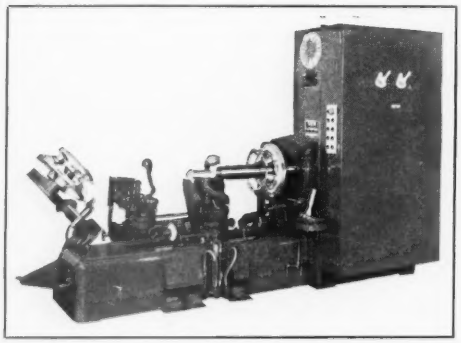
Reporting News and Machine Design Developments

IN BUSINESS TO **NRM** REDUCE YOUR COSTS

FOR TIRE BUILDERS...GREATER UNIFORMITY OF PRODUCT...INCREASED PRODUCTION

Tire building operations are being simplified with NRM's new automatic time-cycle control

The human element affecting quality of product as well as output is being greatly reduced in tire building operations. By replacing most of the manual functions with automatic operations, the *NRM Model 50 Sequence Timed Automatic Tire Builder* is today not only turning out more tires hour after hour but producing greater uniformity of product from tire to tire.



With the *NRM Model 50*, complete mechanical functions in the building of a tire can now be pre-set on a program drum. Outside of manually placing the leading ply end on the drum and splicing the ends of the ply and stitching the tread splice, the remainder of the tire building cycle is entirely automatic.

To simplify setup and provide means for easily modifying each operational cycle to suit the tire building needs, there is a separate timing adjustment for each station. This adjustment consists of a single electronic timing circuit with multiple timing potentiometers.

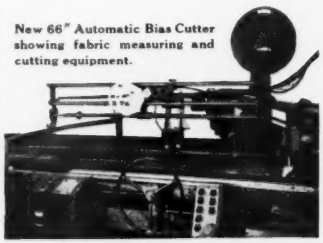
For setup purposes, a pushbutton selects any operation desired. The operator can also manually index the program drum to any station, to skip or repeat an operation where required. All operations are engraved on the drum, keeping the operator informed of the next function in the cycle.

Smooth acceleration for fast application of ply stock in one revolution of the drum without inching is made possible by a reversing two-speed AC high torque induction motor. High speed is used for all stitching operations. Adjustable torque is provided by tapped resistors in series with low speed connections.

In normal use, the operator need simply to depress the foot pedal starter control. From then on the sequence timer automatically takes over, completing from 24 to 30 functions as may be required in the construction of the tire. When desirable, the timer can be operated semi-automatically, eliminating the dwell function and requiring the operator to trip the foot pedal for initiating each automatic operation.

Automatic tools incorporated in the *NRM Model 50* include a pair of bead stitchers mounted behind the building drum. To stitch the fabric around the beads properly, the stitches are operated at two different pressures. Adjustment is provided sidewise for different width tires from minimum "shoulder set" to "21" and diametrically from 12″ to 20″.

The savings in tire manufacturing costs now possible with *Model No. 50 Automatic Tire Builder* are typical of the benefits you get from NRM's research development work. It will pay you to have NRM analyze your production problems. From their 30 years of creative engineering and actual manufacturing experience, it is likely they can suggest further ways of improving the quality of your products, of cutting your costs. Write now or wire National Rubber Machinery Company, 47 West Exchange Street, Akron 8, Ohio. No obligation.

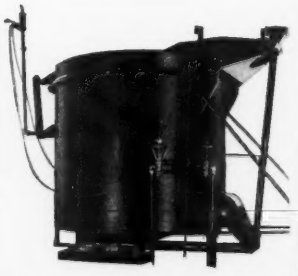


New 66″ Automatic Bias Cutter showing fabric measuring and cutting equipment.

NEW EQUIPMENT OPERATES BIAS CUTTERS AUTOMATICALLY

Completely automatic cutting of bias fabric for any pre-selected width from 10″ to 48″ is now being achieved with new electronic and mechanical equipment recently perfected by NRM. Accuracies of plus or minus $\frac{1}{32}$″ are being maintained with up to 20 cuts per minute, resulting in greater accuracy at less production cost.

Simple and foolproof in design, the new NRM control equipment can be readily adapted to your present as well as to new NRM Bias Cutters. For added safety, a built-in stop breaks the operating circuit when cut fabric is not removed from the end of the table. Complete details and specifications can be obtained simply by writing NRM.



***Another example* of NRM's constant effort to reduce costs . . . the new 120″ Vacuum Expander for large tires, installed in a leading tire manufacturer's plant.**

NATIONAL RUBBER MACHINERY CO.

General Offices & Engineering Laboratories
Akron 8, Ohio

PLANTS at Akron and Columbiana, Ohio and Clifton, N. J.
AGENTS East: National Rubber Machinery Co., Clifton, N. J.
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EUROPE Rubber Machinery: GILLESPIE & COMPANY
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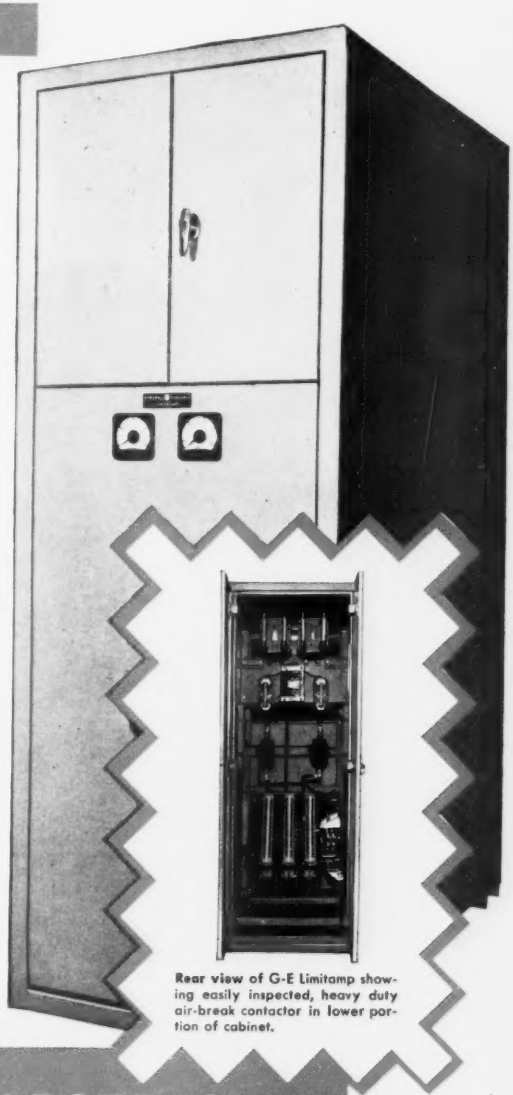
NOW! FOR THE FIRST TIME

*for motors up to 2250 hp**

LIMITAMP HIGH-VOLTAGE CONTROL



This G-E Limitamp motor controller with a new 400-amp air-break contactor is pre-engineered, factory assembled and tested—with all the control and motor protection you need in one steel enclosure.

Current-limiting EJ-2 fuses provide short-circuit capacity up to 250,000 kva. Air-break contactors are good for millions of operations with only routine maintenance, so Limitamp control is recommended especially for motors on severe duty cycles. Low first cost (only $5300** for 2250-hp synchronous motor control) as well as continuing savings because of low operating and servicing costs, make this an economical buy.

Available for 2300-volt motors up to 1250 hp, and 4800-volt motors up to 2250 hp. Ask your nearest G-E sales engineer for more information on the new 400-amp size, or write for Bulletin GEA-5409 for details on G-E Limitamp control. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

**2500 hp for 1.0 pf synchronous motors.*
***List price. Subject to change without notice.*

Rear view of G-E Limitamp showing easily inspected, heavy duty air-break contactor in lower portion of cabinet.

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for all purposes

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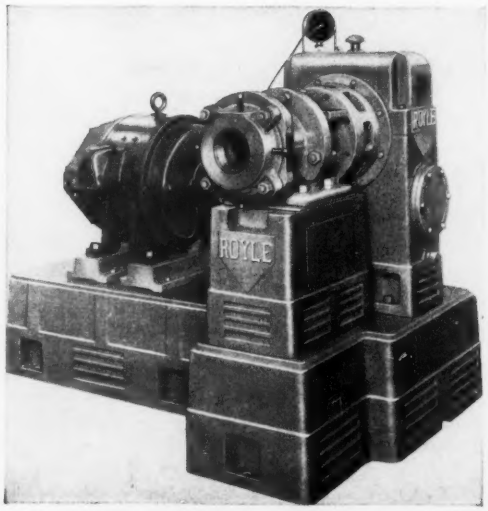
IN these days of rapidly changing developments owners of Royle extruding machines are in the advantageous position of being able to adapt their extruders to either rubber or plastics production. If you are faced with the problem of extruding rubber and plastics the versatility of ROYLE extruders is of paramount importance to you. Whether you require a light or heavy production extruder features have been incorporated to assure maximum results. The change-over is quickly and simply accomplished.

Send for your copy of Bulletin No. 448. It describes these features and how they may be applied to older type extruders.



ROYLE # 2 Extruding Machine. Non-extended cylinder, plain tubing head.

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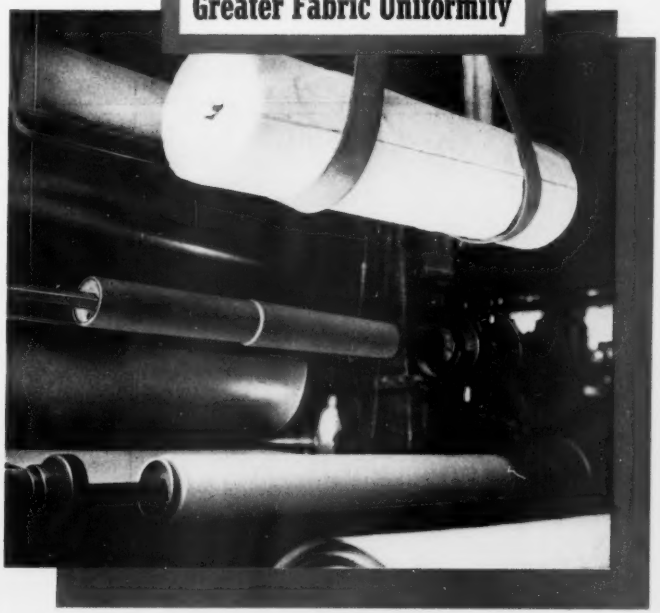

The greater uniformity of Mt. Vernon fabrics means *consistent* quality in your finished products—smoother, more efficient fabrication.

AT YOUR SERVICE

Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.

GAUGING FABRIC THICKNESS AFTER WEAVING. One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products.

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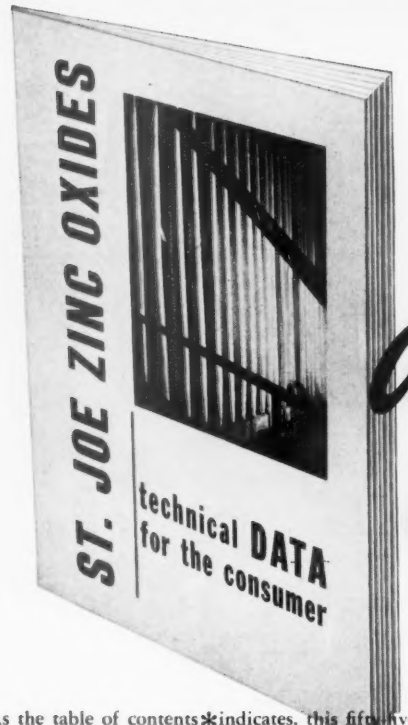

now available

to Purchasing Agents and Technologists in the ZnO-consuming industries — *with our compliments!*

As the table of contents ✻ indicates, this fifty-five page book is intended to be a complete and informative manual on lead-free zinc oxide. In preparing the book, we have included only that material which we considered to be of maximum interest and value to technologists in the consuming industries.

The book has been divided into two parts. Section I concerns itself with the production of St. Joe commercially lead-free zinc oxides; it is a detailed and illustrated, step-by-step itinerary which begins underground in one of our zinc mines in upper New York State, and ends with the packing of the finished product in our Josephtown, Pennsylvania plant. Section II contains representative technical data on our various grades of black, red and green label zinc oxides, accompanied by photomicrographs and charts analyzing their particle size distribution characteristics. In addition, Section II includes a brief discussion of the role of zinc oxide in the major consuming industries.

Our reason for devoting twenty pages of this book to the production aspects of our zinc oxides will become apparent upon consideration of these facts: The trade term "Zinc Oxide" describes a series of materials that may be quite different from the material which is identified by the chemical symbol ZnO. Actually, ZnO is only a part of the materials thus described although its content is usually from 95.0 to 99.8% by weight. Other materials which may be a component part of commercial zinc oxides are, in some cases, beneficial and in others objectionable from the viewpoint of the consumer as well as the manufacturer.

Generally speaking, the characteristics possessed by the various zinc oxides now on the market were not developed by specifications set up by consumers, *but are the result of the various conditions surrounding the manufacture of the pigments.* A knowledge of zinc oxide production is thus an asset to consumers because different production methods result in pigments possessing different chemical or physical properties, and their applications have certain limitations which are important for consumers to recognize. This is the reason we have covered our production methods in considerable detail, and it is our belief that this will result not only in a better and wider utilization of commercially lead-free zinc oxides generally, but also in a greater appreciation of the high quality of St. Joe Zinc Oxides.

✻ CONTENTS

- A Short History of the St. Joseph Lead Company
- The Production of St. Joe Zinc Oxides
- General Properties of Zinc Oxide
- Zinc Oxide in Rubber Compounds
- St. Joe Rubber Grade Zinc Oxides
- Zinc Oxide in Protective Coatings
- St. Joe Paint Grade Zinc Oxides
- Zinc Oxide in the Chemical, Pharmaceutical and Other Industries
- Zinc Oxide in the Ceramic Industries
- St. Joe Ceramic Grade Zinc Oxides

PLEASE WRITE FOR YOUR COPY ON YOUR COMPANY LETTERHEAD

ST. JOSEPH LEAD COMPANY

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ENGINEERED FOR YOUR PRODUCT

PELLETEX

Carbon Black *Plus!*

When you buy PELLETEX, you buy more than carbon black. You purchase the assurance that whatever the quantity, PELLETEX quality will be uniformly high. The General Atlas trademark is a further guarantee that these SRF pellets will be outstanding for their high tensile strength, ease of processing, and excellent abrasion resistance. Actual performance in rubber proves why PELLETEX has been the leader of carbon blacks since 1928.

CABOT **The GENERAL ATLAS Carbon Co.**

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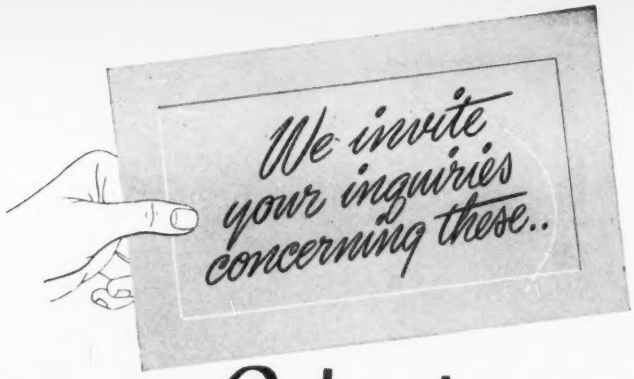
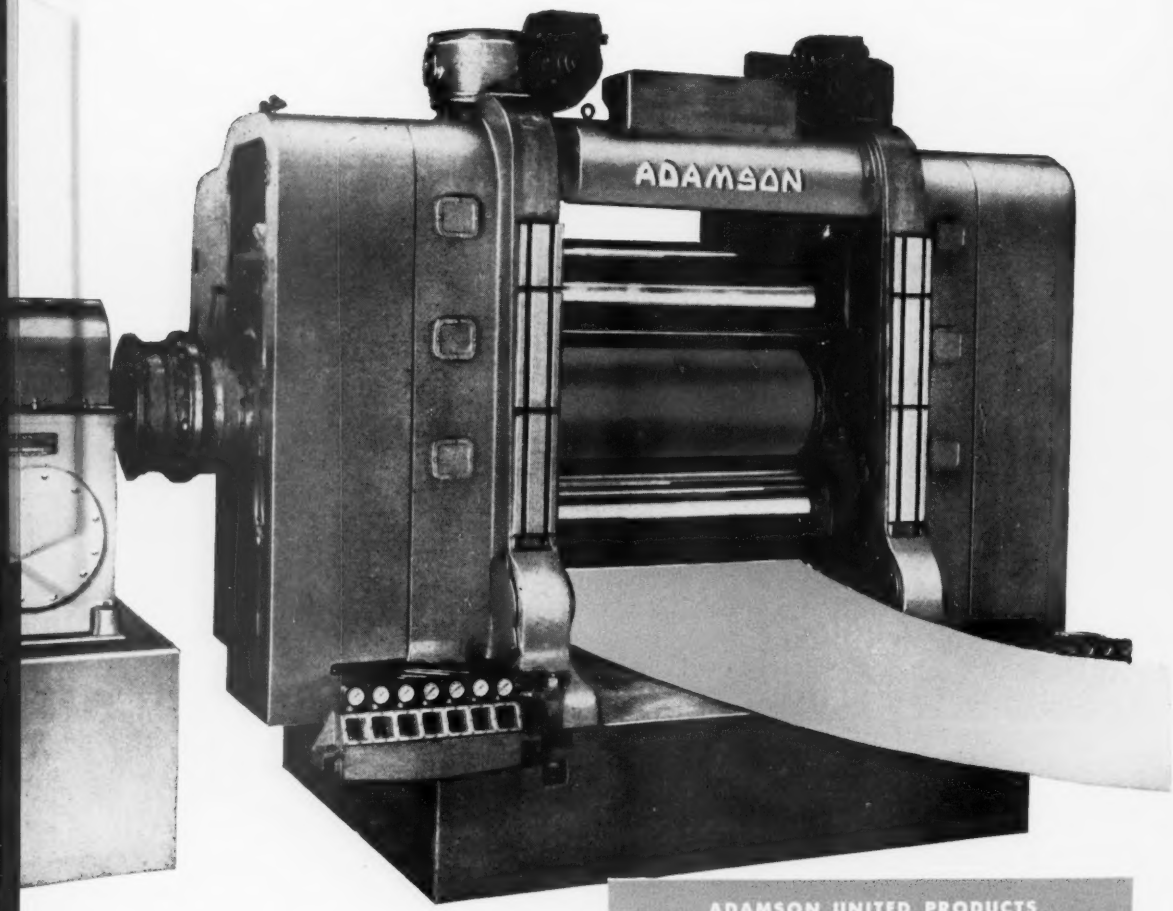
The B. E. Dougherty Company, Los Angeles and San Francisco • Delacour-Gorrie Limited, Toronto



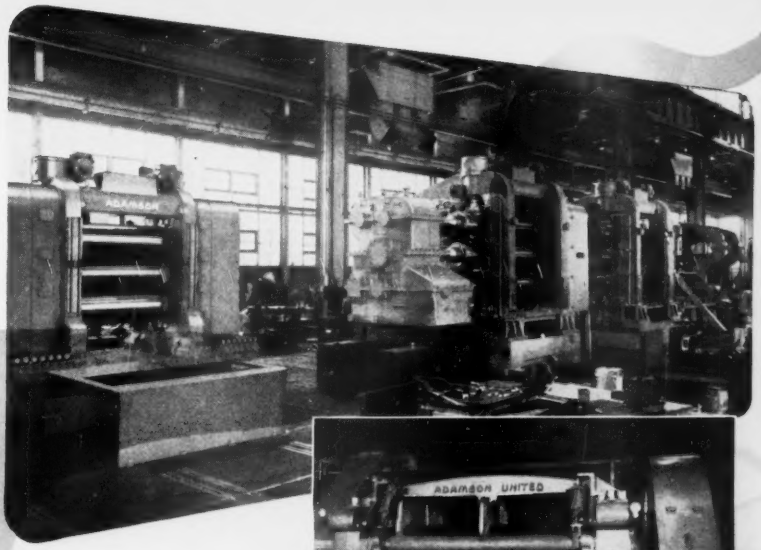
new Adamson Calenders



24" x 68" Standard 4-Roll Calender with flood lubricated roll bearings, even and friction connection gears, and Cone Worm Drive direct connected to middle roll.

ADAMSON UNITED PRODUCTS FOR THE PLASTICS INDUSTRY

- Calenders for plastic film or coated fabrics—all sizes
- Cooling Rolls for calendered film
- Wind-ups for calendered film
- Cut-offs for rigid plastic sheet
- Festoons or Storage Compensators for plastic coated fabrics
- Wind-ups for calendered fabrics
- Embossing Calenders
- Mixing Mills—all sizes up to 28" x 84"
- Autoclaves with quick opening doors
- Plywood Presses
- Full line hydraulic presses, pumps and accumulators



Calender Assembly Floor, New Castle Plant.
24" x 68" Std. 4-Roll Calender in foreground . . . three Precision Type 4-Roll Calenders in background.

For sheeting unsupported Plastic Film

These entirely new Calenders produce film of varying thicknesses ranging from extremely low gauges up to rigid sheets. They permit higher and more uniform roll temperatures so that wider sheets can be calendered. Uniform gauges across width of sheet are maintained with no change in roll crown.

THE NEW 24" x 68" STANDARD 4-ROLL CALENDER

This modern unit is ideally suited for the manufacture of standard types of unsupported film and for the coating of fabrics. It is capable of producing the finest quality product at high production speeds. Some outstanding features are:

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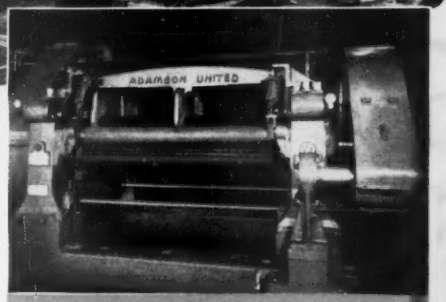

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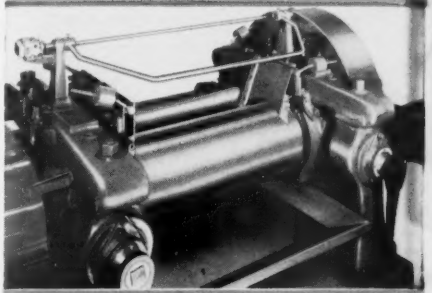

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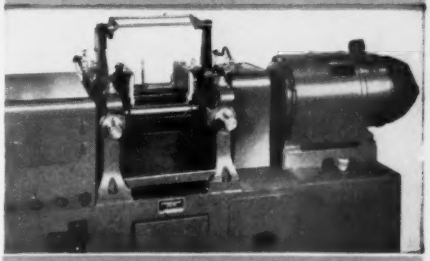

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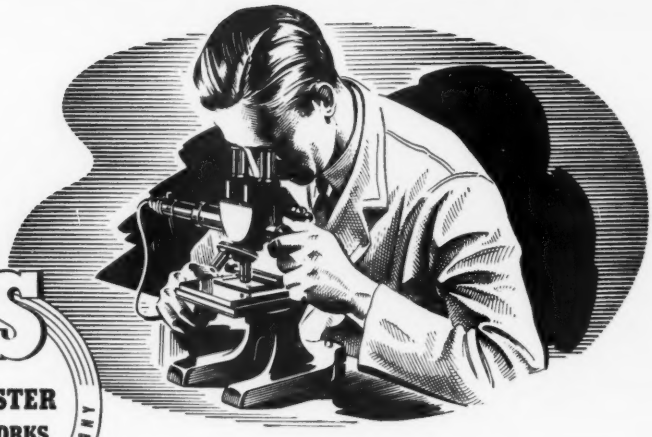

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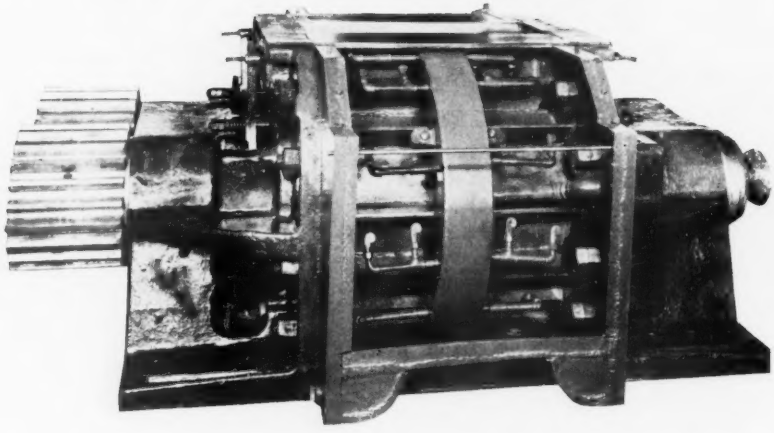

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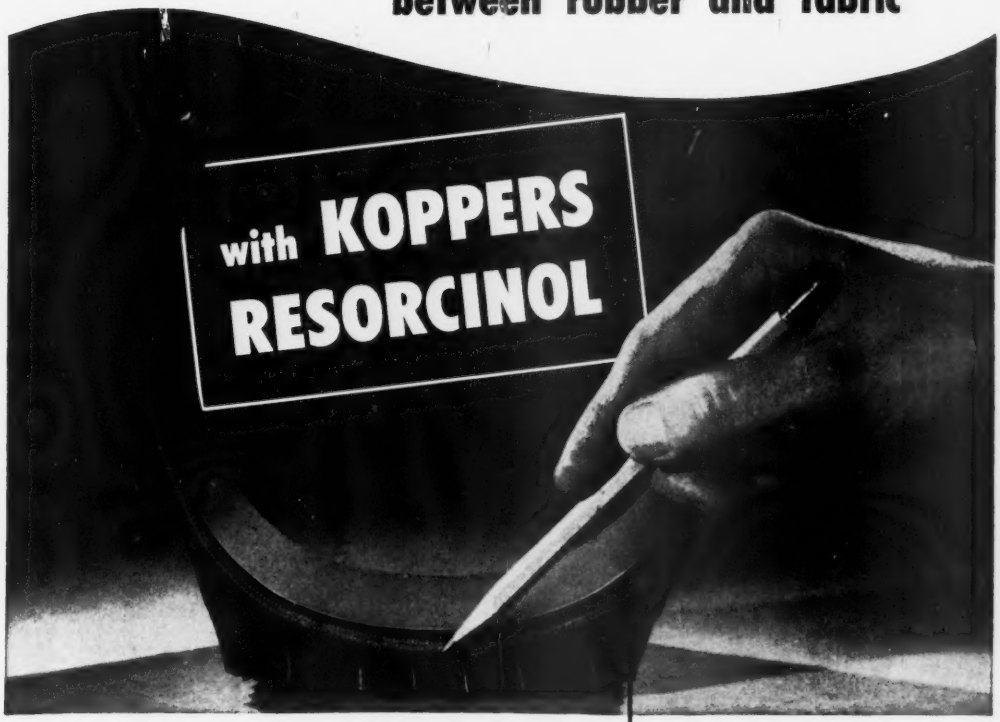

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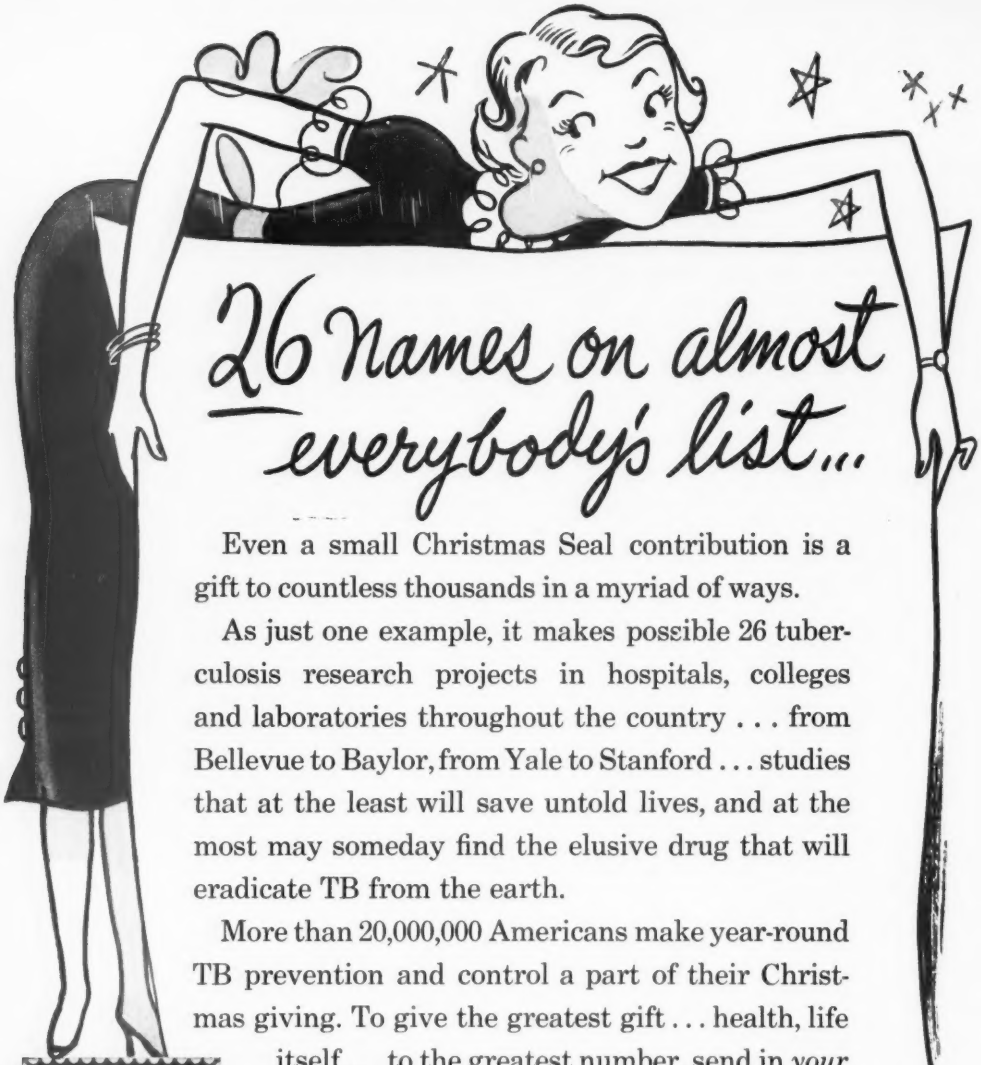

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RUBBER AGE

Vol. 68. No. 2 NOVEMBER. 1950

Compounding Neoprene Products for Resistance to Petroleum Gases

By H. G. BIMMERMAN and R. E. SHRADER

Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Wilmington, Del.

ELASTOMERIC products used in the oil industry are required to meet extremely severe service conditions. The increasing depths of wells brings higher pressures and temperatures into play. In the past considerable emphasis has been placed on the resistance to swell in oil of the products being used. Some failures which have occurred, however, have indicated that swelling such as results from immersion in oil is not the entire story.

As an example, packers which have been removed from service have shown little indication of being swollen by contact with the oil but still have given trouble due to blisters forming and breaking either while the article was in service or when it was removed from the well. Occasionally these blisters may have been due to faulty processing but a careful examination of the product in most of the cases has indicated that gas absorption has occurred and would have caused the difficulty even under the best of manufacturing procedures.

Those conditions which have been encountered indicated that a new type of test might give more information as to how a product would perform in service. Manufacturers of rubber goods and oil well supplies have tested their products in various types of pressure equipment in order to obtain information of this nature. It was decided that a somewhat similar study of neoprene compounds would be of interest to rubber compounders.

There is no question that a field test is the final answer as to whether a product will do a satisfactory job. Since conditions in almost every application vary widely it is both expensive and time consuming to depend entirely upon field tests in the development of more suitable products. The variables of a laboratory test can be controlled, and if test conditions are chosen which approach the range of service conditions fairly reliable results may be obtained.

Immersion Medium—Temperatures—Procedure

The question of the immersion medium is of major importance. The use of crude oil was first considered but since crudes vary so widely from field to field, it was decided that it would be desirable to use some other material. Crudes which are high enough in low molecular weight petroleum fractions would have to be stored under pressure and duplication of results from test to test would be difficult. Gasoline was open to the same objection as crude in that the lower boiling fractions might be lost during storage so that test conditions would vary. The swelling action of kerosene remains quite constant and is about as severe on most elastomeric products as that

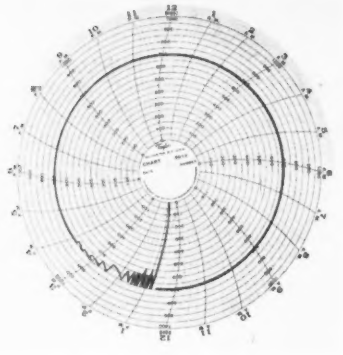

FIG. 1—Typical time-pressure curve.

of any of the crudes. It would, however, be necessary to use a hydrocarbon gas in combination with the kerosene in order to develop suitable pressure within the specimens being tested. Since there is considerable methane in crudes it was chosen as the gas.

Temperatures encountered in oil wells vary over a very wide range and since temperature has so much effect on the physical characteristics of any elastomeric compound, it was decided to work in the upper ranges which might be experienced in deep wells. Most of the work was conducted at a temperature of 302°F. Preliminary tests indicated that pressures had to be increased to a certain point before failures simulating those which had been seen in service were obtained, and a pressure of 700 psi was adopted. An electrically-heated autoclave equipped with safety discs was chosen for the work.

The simplest method of procedure appeared to be to use sufficient kerosene to completely submerge the specimens and then to introduce the methane while the autoclave was still at room temperature until a pressure of 700 psi was reached. At room temperature the pressure held fairly constant and there was apparently very little absorption of the methane by either the kerosene or the specimens. When the temperature was elevated to 302°F., however, the pressure drop was rather rapid. If the pressure was not brought back up to 700 psi the desired results were not obtained.

It was found that more consistent results were possible if the autoclave was raised to the operating temperature before the gas was introduced. By following this procedure the pressure could be brought

TABLE I—COMPOUNDS TESTED AND THEIR PHYSICAL CHARACTERISTICS

(Cure: 20 Mins. @ 307° F.)

Neoprene Type GN-A	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
Neozone D	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
Stearic Acid	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
Ex. Lt. Calcined Magnesia	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
Zinc Oxide	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
Suprex Clay	20.	60.	150.	—	—	—	—	—	—	—	—	—	—	—	—
Calcium Silicate	—	—	—	17.	35.	70.	—	—	—	—	—	—	—	—	—
CC Carbon Black	—	—	—	—	—	—	15.	30.	50.	—	—	—	—	—	—
HAF Black	—	—	—	—	—	—	—	—	—	15.	30.	50.	—	—	—
HMF Black	—	—	—	—	—	—	—	—	—	—	—	—	15.	35.	75.
Hardness	50	63	84	53	65	85	55	70	84	51	65	82	50	63	84
Modulus at 200%	420	780	1300	380	620	1000	500	1080	1925	510	1425	3000	410	1150	2975
Tensile Strength	4950	3600	1625	3650	2700	1825	4625	5325	5675	5000	4225	4000	4500	3300	3350
Elongation	920	830	620	880	800	600	790	630	490	800	500	290	890	600	280
Neoprene Type GN-A	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
Neozone D	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
Stearic Acid	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
Ex. Lt. Calcined Magnesia	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
Zinc Oxide	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
EPC Black	20.	40.	60.	—	—	—	—	—	—	—	—	—	—	—	—
SRF Black	—	—	—	25.	45.	90.	—	—	—	—	—	—	—	—	—
MT Black	—	—	—	—	—	—	35.	70.	150.	—	—	—	—	—	—
FT Black	—	—	—	—	—	—	—	—	—	35.	65.	135.	—	—	—
FF Black	—	—	—	—	—	—	—	—	—	—	—	—	20.	40.	60.
Hardness	52	70	84	54	64	85	50	62	83	50	62	83	51	64	77
Modulus at 200%	600	1650	2775	640	1475	3000	500	1000	1800	470	760	1425	490	1380	2400
Tensile Strength	3825	3925	3975	3550	2950	3200	2625	1950	2025	3450	1925	1525	4325	3700	3675
Elongation	700	470	310	800	500	230	850	600	290	880	780	400	800	510	340
Neoprene Type GN-A		100.			100.			100.			100.			100.	
Neozone D		2.			2.			2.			2.			2.	
Stearic Acid		1.			1.			1.			1.			1.	
Ex. Lt. Calcined Magnesia		4.			4.			4.			4.			4.	
Zinc Oxide		5.			5.			5.			5.			5.	
Reinforcing Silica		17.			35.			70.			—			—	
Mica		—			—			—			20.			60.	
Hardness		58			63			87			55			71	
Modulus at 200%		380			620			1575			460			640	
Tensile Strength		3800			3125			2525			2275			1625	
Elongation		880			800			590			790			700	

up to 700 psi and absorption would take place rapidly. It was then necessary to add more methane to maintain the pressure at 700 psi, but after about three hours the pressure would hold reasonably constant. A typical time-pressure curve is shown in Figure 1.

Although reasonably good results were obtained after 24 hours' exposure it was found that the test was more easily duplicated if the exposure period was 48 hours. At the end of the test the pressure was reduced as rapidly as possible, usually in about 30 seconds. The specimens were then removed, examined and photographed. The temperature was maintained at 302°F. during the time the pressure was released and the specimens were being removed from the autoclave. About 15 minutes were required to open the autoclave and remove the specimens.

Since most industrial products used in the application under consideration are large in size it appeared desirable to use a test specimen which was thick enough to require considerable penetration of the gas in order to produce failure in the center portion. Discs ½-inch thick and 3 inches in diameter appear to be satisfactory. They were cured 30 minutes at 307°F. (60 psi pressure). In order to eliminate the influence of laminations the stock was sheeted out thick enough so that plying up was not necessary. The following basic stock was used:

Neoprene Type GN-A	100
Neozone D	2
Stearic Acid	1
Extra Light Calcined Magnesia	4
Zinc Oxide	5
Filler	Variable

Instead of carrying the study out strictly on a volume basis it was decided that a more practical approach would be to study various compounds which covered a hardness range of 50 to 90.

Most oil well products require good abrasion and tear resistance and these qualities have usually been obtained by compounding with various types of blacks as reinforcing agents. It was felt, however, that the study should be broadened to include non-black fillers. The compounds tested and their physical characteristics are summarized in Table I.

Results of the Tests

Some of the specimens showed considerable increase in size immediately upon removal. There were some surface breaks but the general appearance was that of a sponge stock which was set up or cured too rapidly in the mold. As the specimen cooled it shrunk materially and examination of the interior showed both torn and intact cells. Other specimens appeared to have been saturated with gas which expanded and formed holes which quickly tore producing many small tears throughout but not much sponging in the intact sections between the tears. Other conditions produced a few large surface blisters which did not burst but remained in evidence long after the specimen was removed. This latter type of failure is similar to blisters which have been noticed on packers which have been used in the field. When the conditions of the test are not too severe or when an extremely gas resistant compound is used there is little visible effect. Examples of the results which were obtained are shown in Figure 2.

FIG. 2—Types of failures.

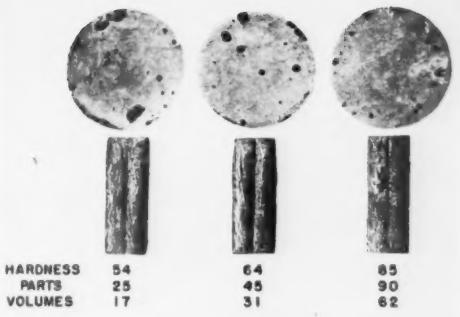

FIG. 3—Effect of loading with SRF black.

Results obtained indicated in general that the resistance to failure increased as the loading increased. The lightly loaded stocks were severely sponged and practically no part of the specimen was unaffected. This deterioration had proceeded so far that the specimen retained little actual strength. Increasing the loading reduced the sponging. The character of the failure changed and it appeared that the expanding gas bubbles tore the specimen rapidly and permitted the gas to escape. Small portions between the tears were not porous and appeared to be unaffected. The effect of variations in filler loadings is shown in Figure 3 which compares stocks compounded with varying amounts of SRF black.

The wide difference in the reinforcing power of the available blacks would be expected to influence the results obtained. However, the various specimens containing the different blacks did not show outstanding differences. The results did indicate, however, that the softer blacks might show some advantage if it is necessary to compound to a definite hardness. The volume loading necessary to produce a given hardness was much higher with the softer blacks and this may have attributed to the apparent slightly better results obtained through their use. Volume loading is not the entire story since the stock with MT black at 2½ times the volume loading is not a great deal better than a stock having similar hardness compounded with EPC black. SRF black having an intermediate loading between the EPC and MT black stock may be slightly better than either.

Since the blacks did not show outstanding differences in gas resistance the choice of filler in most applications would be greatly influenced by other physical characteristics the service might require. Many oil well compounds have been formulated with

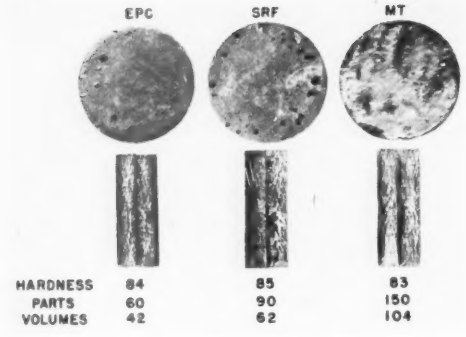

FIG. 4—Comparison of EPC, SRF and MT blacks.

blacks to produce products which have given very satisfactory service. The results obtained with the three types of black are compared in Figure 4.

The results obtained on the stocks containing non-black fillers were very surprising. At the two lower hardness ranges tested, clay, mica, calcium silicate and reinforcing silica were all seriously affected. At the higher hardness range, clay showed only a slight improvement and mica showed practically no improvement and was entirely unsatisfactory. However, stocks containing the higher loadings of calcium silicate and reinforcing silica gave very excellent results. The calcium silicate stock showed only 3 or 4 internal tears. The stock containing reinforcing silica appeared to have been unaffected by the gas pressure. The results obtained on these two stocks are shown in Figure 5.

It is obvious that the temperature encountered in service may vary widely depending upon the depth and location of the well involved. It therefore appeared desirable to make a study of the effect of variations in temperature of testing on the results obtained with the laboratory procedure. For this investigation an EPC stock having a hardness of 84 was selected and tests were run at 212°F. and 302°F. In all cases a standard methane pressure of 700 psi was employed.

The results obtained were consistent with previous experience with elastomeric products, the highest temperature showing the greatest degree of failure. At 212°F., the specimen which had shown almost complete failure at 302°F. was hardly affected. At 212°F. the stock showed only a slight tendency to blister whereas it had been severely affected and showed many structural breaks at the higher temperature. At the lower temperature the tear resistance of the stock was higher and the gas pressure did not rupture the specimen while at the higher temperature the expansion of the gas probably expanded the specimen beyond its ultimate elongation at the temperature of 302°F. and tears resulted. This effect of temperature is illustrated in Figure 6.

In order to determine the effect of pressure in the absence of gas a run was made at 302°F. in which no gas was present but the pressure of the kerosene was held at 700 psi by the use of a pump. A similar run was made at the same temperature at atmospheric pressure. As shown in Table II there was no appreciable difference in the volume increase and no sponging in either case.

In most oil field applications it has been important to be sure that neoprene products have been adequately cured. The effect of cure was determined by testing specimens which had been cured for 15, 30 and 60 mins. at 60 lb. steam pressure. For most applications a cure of 30 mins. at 60 lb. steam pressure for a specimen of the size used in these tests would be satisfactory. Fifteen minutes would be decidedly on the under side and 60 mins. would be a very full cure. In this test, however, there appeared to be little change in gas resistance when the stocks were cured over the above range. Although gas resistance, as determined by this test, was affected very little by the state of cure of the specimen the importance of the proper cure to obtain adequate physical properties such as good tear, abrasion resistance, and low set must not be overlooked.

Discussion of the Results

As with any compounding study in the rubber field the obtaining of some information and the answering of some questions brings up many additional ones. The work reported in this paper indicates that more information is needed on the effect of increasing the loading of the black compounds. It would be interesting to know whether a higher loading of EPC black would approach or equal the results obtained with reinforcing silica. The use of blends of reinforcing silica and blacks might show some promise but since the lower loadings of reinforcing silica were unsatisfactory this assumption may be questioned.

In order to reduce the variables the compounds studied contained no softeners and in many cases would be impractical factory batches. Would the addition of softeners necessary for satisfactory processing make the compounds less resistant to gas? This is doubtful since under the high temperatures at which the tests were conducted considerable absorption of kerosene did take place and oil in the compound would probably decrease this absorption.

The results obtained in this investigation indicate that the proposed method of laboratory evaluation should prove valuable in the development of superior compounds for use in oil field applications. It has demonstrated that the types of failure induced are quite similar to those encountered in service and

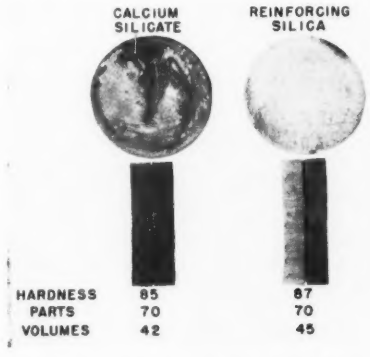

FIG. 5—Comparison of non-black fillers.

TABLE II—EFFECT OF PRESSURE ON VOLUME INCREASE

Parts of Carbon Black	—% Volume Increase— Atmospheric Pressure	700 psi Pressure
0	50	49
20	37	39
80	22	25

points out the importance of factors other than swell in oil in the determining of suitability of elastomeric products.

Undoubtedly one type of failure which is encountered is brought about by absorption of gas under pressure followed by rapid expansion as the pressure is released. The severity of this type of failure increases with increasing temperature and is minimized by increased filler loading. Variations in the type of black employed have only minor effect on this type of failure. Stocks containing non-black fillers such as calcium silicate and the reinforcing type of silica show sufficiently greater resistance to warrant further investigation.

It is important to remember that service tests are the final proof for any product and the conditions of the laboratory test should not be made more severe than actual service conditions. Since many of the products which encounter conditions approaching those of the laboratory test are partially surrounded or protected by metal the free exposure of a sample increases the severity. Also, it must be remembered that in actual use such rapid pressure drops as employed in the test do not often occur. In the development of a practical stock it may be desirable to modify the test to more closely approach the actual service conditions.

FIG. 6—Effect of temperature (60 parts EPC black, Hardness 84)

Power Brushing Operation Roughens Rubber Back of Plastic Laminate

A POWER brushing operation to roughen the rubber back of decorative plastic laminate, developed by a midwestern mechanical rubber company, with the aid of the Technical Department of the Osborn Manufacturing Company, of Cleveland, Ohio, is resulting in large time, labor and cost savings.

This machine, said to be the first of its kind in the industry, replaces previous manual operations necessary to prepare the laminate for a permanent cement anchor. Fine grooves, which are cut into the rubber with the fine wire brush, provide a base into which the cement can anchor. In addition to the final product being more uniform and of a higher quality, the time and cost of manual roughing is eliminated.

An additional advantage of this power brush operation is the close tolerances it is able to maintain. The thickness of the laminate is held to within .002 since the only manual labor involved is feeding the three and one-half feet by seven feet plastic laminate sheets into the machine.

The first sheet is manually fed into the brush machine. Masking tape is then used to bind the other sheets, butt end to end, so that after the machine has started the feeding is continued automatically and controlled by feeder rolls in the machine that maintain a constant speed of 45 inches per minute.

An Osborn Heli-Master brush 52 inches long with a 15-inch diameter and filled with .005 fine wire is used to cut the grooves and roughen the rubber surface. This brush rotates at 1200 revolutions per minute. A back-up roll beneath the sheet maintains the proper pressure of work against the brush face and controls the close tolerance.

A device to trim the wire brush surface is incorporated in the machine to maintain its cutting effectiveness. At pre-determined intervals, the Osborn Heli-Master brush is rotated in reverse against a stone block. The ends of the fine wire brush are thus returned to original sharpness after having been dulled through constant use.

The cleaning of the fine rubber dust created by the roughing action is also accomplished by an Osborn power brush. An Osborn Master Strip Rotary brush 52 inches long with a 15-inch diameter and filled with .016 nylon, brushes the laminate sheet as it emerges from the roughing brush. The fine rubber is thus brushed into a forced air ventilating system and removed from the operation.

View of power brushing operation.

Panel Discussion On Rubber Compounding Problems

Sponsored by the Boston Rubber Group at its Meeting on October 20, 1950

RUBBER compounding problems of a specific as well as a general nature were considered by a group of experts at the panel discussion on rubber compounding held by the Boston Rubber Group on October 20 at the Somerset Hotel in Boston, Mass. John T. Blake, director of research for the Simplex Wire & Cable Co., Cambridge, Mass., acted as moderator for the panel discussion. In an opening address, Mr. Blake stated that in arranging for the program, several standards had to be established by the panel group.

Approximately 160 questions had been submitted to the panel for consideration. First, the panel screened out those questions that did not strictly deal with compounding. Other questions were condensed or combined so that the greatest number could be answered in the allotted time. As a result, about 40 different questions were discussed by the panel. Mr. Blake explained that this prior consideration of the questions, which were submitted by mail, allowed the panel members to prepare detailed answers which might be impossible if they were treated extemporaneously.

The questions were presented to the panel anonymously, so that the members might be able to answer more freely. There were no discussions from the floor. However, at the conclusion of the question and answer period, members were permitted to approach various members of the panel for private discussions. The members of the panel included J. H. Fielding (Armstrong Rubber), B. H. Capen (Tyer Rubber), C. C. Davis (Boston Woven Hose), W. H. Couch (Simplex Wire), W. E. Walker (Hood Rubber), L. R. Clarke (Haartz-Mason), H. S. Liddick (Davidson Rubber), and W. S. Edsall (Goodyear). The panel discussion follows herewith:

Question—Why do so many toplifting products spread on the shoes?

Answered by Mr. Edsall: It has not been the finding of the speaker that current toplifting products in general spread on shoes. That is, they do not spread in comparison to toplifts of past years. However, there are some on the market which do spread to a considerable degree, and it is my assumption that the questioner is referring to this particular type of toplifting. Generally speaking, spreading is caused by lack of sufficient tightness of cure, which is usually induced under present day compounding methods by too great a quantity of thermoplastic materials which in themselves are not vulcanizable.

One must realize that a toplift, as such, requires or rather gets more abuse than most any other type of shoe bottom material, since a large portion of these go on very small heels on women's shoes. This results in an excessive pounding on a very small area. Utmost care must be taken to see that a proper balance of all ingredients are used in the toplifting compound and to see that there is not too much permanent set, or in other words, the cured stock must be to a full, tight cure.

Question—Why is an eight-hour rest period desirable after the initial mill mixing of GR-S?

Answered by Mr. Fielding: There is no technical reason why a rest period is desirable in the case of GR-S. Provided that the first mix is cooled to room temperature, an additional waiting period has no measurable effect on the efficiency of a second milling step.

Question—Is there a compounding agent which will come to the surface during vulcanization and give a permanent lacquerlike finish on footwear?

Answered by Mr. Walker: The application of lacquer to improve the appearance of waterproof footwear and to eliminate surface tack is now in general use among footwear producers. The question is: Can the compound be so changed that lacquering will not be necessary? We believe the answer is "no." At least, our very numerous attempts have been unsuccessful. Laboratory tests that have looked promising cannot be duplicated on a factory scale. For instance, indications in the laboratory after experimenting with numerous compounds were that a polyethylene glycol wax or an amide of a fatty acid would function in place of lacquer but when tried on a factory scale and actual shoes produced with no lacquer, such was not the case. The shoes were not characterized by the shine imparted by lacquer and the "tack" or "drag" of the surface was still evident to some extent. One condition to watch for when eliminating lacquer is the sifting of fine cardboard and paper dust from the inside of the carton or the wrapping paper. The very slightest tack will hold this dust, producing an unsightly article.

Question—What type of curative system should be used in a natural rubber stock to obtain best low-temperature properties?

Answered by Mr. Capen: I do not believe that there is any particular combination of accelerators and sulfur which produces a stock which shows superior qualities at low temperature. I believe this is best

accomplished by the proper choice of plasticizers. I do think, however, that a good tight cure does give better properties at low temperature.

Question— How can a clean, smooth, cementable surface on calendered goods be obtained without a Holland separator?

Answered by Mr. Clarke: This question is peculiar to a certain product and a clear cut answer seems difficult. If the cost of the Holland is the objectionable feature a suggestion to try polyethylene film or treated interleaving paper will materially reduce cost. If the product is to be cured prior to cementing, zinc stearate as a dust can be used. This will disappear on vulcanization leaving a cementable surface. If the product is to be further fabricated in the plant in which it is coated a treated liner can be used. Soap solutions sometimes are employed and even surface treatments with bromine or sulfur chloride work in special cases.

Question— What is the best type of compound for low swelling in aviation fuel containing a high percentage of aromatics?

Answered by Mr. Davis: Because it is the most resistant of all elastomers to aviation fuel, Thiokol might be expected to be the most popular material for this service. However, processing difficulties and cold flow in service are serious enough to preclude its use except when the most extreme solvent resistance is demanded. The best practical stocks are nitrile rubber compounds, which are readily processed, are very resistant to aviation fuel, and have physical properties quite adequate for most service conditions.

Let me add a word about plasticizers. In service, plasticizers are ultimately extracted by the solvent, but some are extracted far more rapidly than others. Hence, in a short extraction test, as in specifications, there are two opposing effects—an increase in volume from swelling in the solvent, and shrinkage resulting from removal of the plasticizer. So if you have some dumb specification to meet, you must choose a plasticizer, not because it's the best one, but because it happens to make the stock swell or shrink in accordance with what someone with a desk job who wrote the specification thought was a bright idea.

This is one of those cases where a product which meets a specification may give poorer service than one which fails to pass the specification. In other words, with the help of such a specification, the customer is assured that he will pay more for his product and will be certain to receive a poorer product than the manufacturer would otherwise give him.

Question— Can a GR-S insulation stock cured by the CV process be made super-aging?

Answered by Mr. Couch: Yes. GR-S super-aging and heat resisting compounds are cured by the continuous vulcanizing process. There are undoubtedly many different curing combinations being used for this purpose. For a mineral base GR-S compound containing 30 to 40% GR-S by weight, the use of 3% tetramethyl thiuram disulfide on the GR-S as the primary curing agent plus 0.5% sulfur and 1.5% selenium diethyldithiocarbamate will give an insulation on 14 sol.–.047" wall which can be vulcanized in about 25 secs. at 400° F. (230 p.s.i. steam pressure). This compound is inclined to be "scorchy" but can be handled if the proper precautions are taken. A somewhat safer compound from a processing standpoint contains 3% selenium diethyldithiocarbamate plus 1% mercaptobenzothiazole and 0.1% copper dimethyldithiocarbamate on the GR-S. Such a compound is somewhat slower curing but can be vulcanized in 30 seconds at 400° F. on the same size of wire.

These compounds are of super aging quality and after 20 hours air pressure aging (at 80 p.s.i. air pressure and 260°F.) will show approximately 10 to 20% decrease in tensile strength and 25 to 35% decrease in elongation. After 168 hours oxygen pressure aging at 300 p.s.i. oxygen pressure and 80°C., the depreciation in tensile strength will be approximately 10% and in elongation about 20%. The initial physical properties will vary, of course, with the kind and amounts of the fillers employed.

In general, the GR-S compounds with super aging and heat resisting qualities can not be vulcanized as rapidly as the performance grade compounds. A 35% GR-S mineral base performance grade compound can be vulcanized about twice as fast as the super aging compound of the same rubber and filler content.

Question— What can be added to a stock containing white factice to overcome the tendency of the latter to retard curing?

Answered by Mr. Liddick: Lime and heavy calcined magnesia are the materials most commonly used. Triethanolamine can be used. Several factice manufacturers have a treated white for faster cures.

Question— What compounding ingredients improve mold release, and also improve the finished surface?

Answered by Mr. Edsall: There have been a great number of materials on the market which are reputed to perform the desired function mentioned in the question. Within the speaker's experience, there have been three materials that have had any tendency to do this type of work in the compound. The first experience of good results of this type material was with the use of triethanolamine, when used in conjunction with an excess of stearic acid. This gives better mold release and improves the finished surface of some types of compound, but does not work in all cases. Triethanolamine has a definite activating effect; therefore, care must be taken in its use to adjust acceleration to proper levels to reduce scorching tendencies.

The Carbowax materials also have a definite effect on many types of compounds toward aiding mold release and giving improved surface appearance. Another material that gives relief in this matter is Vistac. It, in some compounds, aids mold release and gives an improved finished surface.

Question— What compounding ingredients cause blueing (galvanizing) of black footwear compounds in the heater cure?

Answered by Mr. Walker: This question refers to the blue or dull cast apparent on black cured footwear. The condition is much more apparent in hot humid weather. Our investigation indicates that no single factor is the cause but it is a combination of several factors. The factors most responsible for this unsatisfactory condition are: (1) Lacquer, (2)

GR-S, (3) Vulcanizer, and (4) Filler. Vinyl lacquers tend to cause the bluish cast more than other types. Blue cast varies directly with the amount of GR-S. Cold rubber, rubber made for low temperature service, rosin soap (GR-S 17) and alum (45AC) are the best of the various types of GR-S. Naturally, if your vulcanizer contains excessive moisture, the blueing will be enhanced.

An examination of fillers proved that variations of these were sensitive to the condition. There does not seem to be any system of classifying them or determining the cause for the behavior. However, clays and precipitated whiting are satisfactory while calcium sulfate, finely ground limestone and chalk whiting are not. Investigation of other materials, such as antioxidants, softeners, tackifiers, blacks, etc., have shown no results. Aging before applying lacquer has no appreciable effect.

Question— Are tires containing small percentages of reclaim much poorer than first-line tires?

Answered by Mr. Fielding: There is no answer to this question because first-line tires do contain a small percentage of reclaim. This reclaim is used judiciously and the resulting tire is no poorer from the standpoint of the customer than a tire containing no reclaim. This use of reclaim makes a tire cost less and therefore has the result of giving the customer more miles per dollar spent.

Question— When is it of advantage to use two or more polymers in one compound: for example, rubber plus GR-S; GR-S plus neoprene; neoprene plus nitrile rubber?

Answered by Mr. Davis: This is a case where you cannot expect to have something for nothing. In other words, if you blend one type of rubber with another to gain some advantage, you must be prepared in most cases to sacrifice a little something in return. For example, if you add GR-S to neoprene tubing to prevent flattening don't expect much good oil resistance and sunlight resistance.

It is safe to say that all blends are essentially compromises. Probably the most widely used blends are those of natural rubber and GR-S. For example, many a compounder has found that the addition of a minor proportion of GR-S to a major proportion of natural rubber prevents sagging, flattening, and deformation in general, both before and during curing. Blends of natural rubber and GR-S are also important today to take care of shortages of one or the other, and because of changing prices. Yet I notice that one of our biggest tire manufacturers has chosen to make the outer part of his tire tread of only natural rubber and to confine his GR-S to the interior rather than make his tread a blend of rubber and GR-S.

Small proportions of nitrile rubber in neoprene increase the oil resistance of the latter, without serious detriment to the sunlight resistance or physical properties of the neoprene. Neoprene turns hard in hot air, whereas some rubber stocks soften; hence a proper blend is better than either alone. In aging, each elastomer seems to behave independently, and no abnormal or freak effects are to be expected. Blending of rubbers is certainly of growing interest, and it has so many possibilities that some of you are very likely overlooking various useful mixtures of polymers.

Question— Which is better for judging the natural aging of a GR-S stock, the oxygen bomb or the air oven?

Answered by Mr. Capen: I do not think there would be any choice. The destructive influences on the natural aging of GR-S are light, oxygen, heat and ozone. Since both the oxygen bomb and the air oven tests are conducted in darkness and the oxidation of GR-S is a very slow process, and the ozone present in both pieces of equipment proverbially is the same, the temperature at which the test is conducted would be the most important influence. Therefore, if both pieces of equipment were run at 70°C. as they usually are there would not be any choice as to which method was used.

Question— Is any synthetic better than rubber for making conducting stocks?

Answered by Mr. Clarke: To answer this question correctly one must consider both the type of black and the degree of load. Both natural rubber and GR-M when loaded with 50 parts of acetylene black show a specific resistance of 1200 ohms-cm. units whereas GR-S with the same loading shows 1800 units. Now if this loading is increased 10 parts the resistance of natural rubber and GR-M drop only to 1100 units but the GR-S falls to 800 units. This relationship also holds when 50 or more parts of conductive channel black is used although the figures are, of course, higher. With certain types of furnace blacks, GR-M shows much greater conductivity than natural rubber and can be made to have the same order of conductivity as when acetylene black is used. There is some published data indicating that GR-I, when reinforced with M.A.F., shows the greatest conductivity of any combination

Question— What percentage of flock can be used in shoe sole compounds without affecting flex life or abrasion?

Answered by Mr. Edsall: Generally speaking, up to 20 parts of flock on 100 of new rubber hydrocarbon may be used with a reasonable degree of safety. Of course, this cannot be assumed that it will work in every case, as the amount of other loadings also affect this problem. Flock may be used without any great noticeable effect on abrasion as measured by actual wear tests, but upon all abrasion machine tests it is unusual to use more than 5 parts without a noticeable deterioration as measured by machine abrasion. The factor of flex life is adversely affected by flock, but as stated above, up to 20 parts of flock on 100 of rubber may be used with a reasonable degree of safety.

Question— What are the desired properties of a compound to be tumble-finished?

Answered by Mr. Capen: For a rubber compound to properly tumble-finish it is necessary to have a highly loaded, low modulus compound of low abrasion resistance. One should avoid brittleness since this quality causes sharp edges to chip off. It is sometimes necessary to put a quantity of abrasive material in the barrel at the time of tumbling to aid in this type of finish.

Question— How can the pit-marking of tubing stocks by open steam be avoided by compounding?

Answered by Mr. Liddick: Pit-marking, I believe, is caused by wet steam or condensate and very little good can be done in the compounding. We have minimized the loss due to pit-marking by installing automatic steam controls that insure as near as possible dry steam in our vulcanizer. Preheating the vulcanizer before loading reduces condensate and

also clears steam feed lines. Last, but not least, cover or protect the stock from the live steam entering the vulcanizer.

Question—Can rubber stocks be made electrically conductive by powdered metals, such as aluminum powder?

Answered by Mr. Couch: Rubber compounds can be made electrically conductive by incorporating materials which afford an electrically conducting path through the compound. Acetylene black with a high degree of structure is ideal for this purpose since the particles of black tend to touch each other throughout the rubber matrix. Fine furnace blacks with somewhat less structure are fairly conductive, while channel blacks with little or no structure are still less conductive. A soft black such as thermatomic black becomes completely surrounded by the rubber and so gives a compound with relatively poor conductivity.

Attempts have been made to use powdered metals to improve the conductivity of rubber compounds but without much success. This may be due to interaction between the curing agents and the metals with the formation of sulfides which would be poor conductors. In the case of powdered aluminum we have metal covered with an oxide surface which is a fairly good insulator and so prevents the formation of conducting paths through the rubber compounds.

In general, an electrically conductive rubber compound is said to be one having a resistivity of less than 10^6 ohm-cms. Ordinary rubber insulation shows resistivities of the order of 10^{15} ohm-cms. A GR-S compound containing 50% acetylene black on the GR-S will have a specific resistance of approximately 10^3 ohm-cms., 50% EPC black may give approximately 10^8 ohm-cms., 50% very fine furnace black will give about 10^6 ohm-cms., while 50% thermatomic black gives relatively high resistivity with values of approximately 10^{13} ohm-cms.

Question—Is GR-S as good as natural rubber in sunlight, and should a sunproofing wax always be used?

Answered by Mr. Fielding: Both parts of this question require discussion. The simple answer to the first part of the question is "Yes." GR-S is as good in general as rubber in sunlight. The simple answer to the second part of the question is "No." All stocks exposed to sunlight should not be protected with a sunproofing wax. However, the phenomenon which is referred to is far from simple and I do not think that the answer is always the same. Sunlight together with the oxygen of the air will cause oxidation of rubber or GR-S. This results in a hardening of the surface which sometimes appears as though a skin has formed. In this respect, GR-S is worse than rubber.

One of the most striking effects frequently attributed to sunlight is cracking. Actually, cracking of rubber or GR-S under slight tension is caused by ozone in the atmosphere and not directly by sunlight. GR-S and rubber are different in their resistance to ozone in the sense that rubber will crack more quickly and over a broader range of elongation than GR-S but when the elongation range is suitable and when sufficient time is allowed, GR-S will crack more than rubber.

The use of a sunproofing wax as a means of preventing atmospheric cracking is a very dangerous thing to do, unless the problem is fully understood and unless testing is carried out under the same conditions as those to which the product will be subjected. One of the most serious errors which a compounder can commit is to test a product under static conditions and then use it under dynamic conditions. Properly handled, sunproofing waxes are very beneficial but it cannot be said that they should be used in all stocks exposed to sunlight or exposed to the atmosphere.

Question—Has the durometer proved successful in judging any properties other than hardness?

Answered by Mr. Capen: Since the durometer reading is the measurement of a predetermined indentor pressed against the rubber sample and the amount of the resistance to this pressure is the recorded density on the dial, I do not see how the durometer reading can judge any values of a rubber composition other than its hardness.

Question—What is the purpose of cotton or wood flock in shoe soles?

Answered by Mr. Edsall: Cotton or wood flocks have an effect of reducing spreading tendencies. They also give noticeable stiffness with relatively small amounts of loading. Whereas they give definite lowering of abrasion, they do not seem to have the same effect on actual wear tests. They give a fibrous texture to a soling stock which makes it more in the category of a leather-like material, which is desired by a large portion of the trade.

Question—What is the most effective method of compounding natural rubber to resist attack by ozone?

Answered by Mr. Couch: Vulcanized natural rubber compounds are not inherently ozone resistant. They can be made ozone resistant by compounding with materials which are inert to ozone, and which give physical properties permitting the compound to relax readily after stresses are applied. Vulcanized vegetable oils, bitumens, clay, talc, and waxes are commonly used for this purpose. Reclaimed rubber is sometimes used also. In such compounds the least possible amount of rubber is used which will give the required mechanical properties.

A typical natural rubber, oil base, ozone-resistant electrical insulating compound contains 20 to 25% rubber by weight. Based on 100 parts of rubber by weight such a compound may also contain 100 parts of vulcanized vegetable oil (factice), 100 parts of hard clay (or talc), 50 parts of reclaimed rubber, 40 parts of mineral rubber (or gilsonite), 10-20 parts of paraffin (or amorphous wax), and 1 part of stearic acid. In addition, of course, the compound will contain zinc oxide or litharge, sulfur, accelerators and an antioxidant.

Such a compound has relatively poor physical properties, 450-600 p.s.i. tensile strength, 250% elongation and 25% set, but meets the physical requirements of ASTM Spec. D-574 for ozone resistant insulation. This compound is fairly ozone resistant and will not crack after 3 hours exposure to 0.010-0.015% ozone by volume when stressed in accordance with the test method of ASTM D-470. Insulations with greater ozone resistance may be obtained by using butyl rubber which has inherently greater ozone resistance.

Question—With prices rising and "poorer" grades of rubber of more interest, is there danger of poor aging? Is additional antioxidant required?

Answered by Mr. Davis: The answer to both parts of this double-barreled question is "Yes." Low-grade rubbers, particularly flat bark crepe, have, of course, various faults, notably their unpredictable rate of curing, their final quality when vulcanized, and their poor aging. As for aging, any copper or manganese which may be present can do great damage. If copper is present, the best

life insurance for the rubber is the addition of one of the very good protective agents now available.

However, rubber may age badly even when no copper or manganese is present, when the raw rubber looks perfectly all right, and when there is no evidence of stickiness, softness, or resinification. This is a perfect example of the danger and futility of the primitive method of buying rubber by appearance alone, with no regard to inherent quality and curing characteristics. A liberal dose of antioxidant will usually minimize this poor aging; plus of course close attention to low sulfur and high acceleration. This is a subject all by itself.

Question—How can a nitrile rubber stock be made tacky in the uncured state?

Answered by Mr. Capen: The best and most successful method of producing a tack in uncured nitrile rubber is accomplished by the introduction of a percentage of natural rubber. The amount added of course renders the resultant compound liable to greater swelling in oils; however, the percentage added does not increase this swelling as one might expect, and satisfactory building tack can be accomplished with amounts of from 10 to 15%. Naturally the more rubber added the greater the tack obtained.

Question—What formulations and methods of calendering are recommended for smooth-running non-black butyl stocks for fabric coating?

Answered by Mr. Clarke: Butyl presents a relatively easy polymer to build into a smooth non-black calender coating for fabric. The fabric should always be primed or anchor coated before calendering. A suggested compound known to run smoothly is as follows:

GR-I #25	100.00
Zinc Oxide	5.00
Soft Clay	62.00
White Pigment and Color	24.00
Stearic Acid	2.00
Sulfur	2.00
Selenium di-methyl dithiocarbamate	1.25
Tetra methyl thiuram disulfide	1.25
Mercaptobenzothiazole	.75
Antioxidant	1.75
	200.00

This formulation will calender at the same speed and temperatures as a natural rubber compound of the same polymer content.

Question—What type of GR-S has the best water-resistant properties?

Answered by Mr. Couch: The glue-acid coagulated GR-S-65-SP and its non-staining variation GR-S-66-SP have the best water resistance of any of the standard grades of GR-S. These are premium priced grades made at the Rubber Reserve Co.'s Naugatuck plant. When tested in accordance with the Rubber Reserve's test method, GR-S-65-SP shows an average water absorption of 7 mg./sq. in. after 20 hours immersion in water at 70°C. Alum coagulated GR-S-AC from Rubber Reserve's Lake Charles plant also has good water resistance with an average of 10.5 mg./sq.in.

Of the standard grades of salt acid coagulated government synthetic rubbers, GR-S-SP, also made at Naugatuck, is the most water resistant, averaging 23 mg./sq.in. or nearly four times as great as GR-S-65-SP (or GR-S-66-SP).

For insulation, the wire industry has preferred the grades mentioned, with GR-S-65-SP and GR-S-66-SP being favored for use when water resistance was of primary importance.

Standard GR-S for tires and mechanical goods generally shows much higher water absorption with values running from 40 to 60 mg./sq.in. after 20 hours immersion at 70°C.

Question—What are the best types of accelerators for an odorless and tasteless rubber stock?

Answered by Mr. Liddick: The thiurams—methyl or ethyl alone, or with a secondary, possibly a guanidine. These accelerators are not odorless or tasteless, but due to the small dosages required produce satisfactory vulcanized rubber products that will meet these requirements.

Question—How can the effects of humidity on the tensile properties of latex films be minimized?

Answered by Mr. Walker: If the intent of this question is to minimize the variation in testing conditions, this certainly can be accomplished by carrying out the testing in an air conditioned room. Humidity controlled cabinets for conditioning the samples might also be considered. In the compounding of rubber latex an avoidance of filler materials which absorb moisture is desirable.

Question—Can a stock compounded for resistance to high temperature be relied upon to be equally good in hot air, steam, or other medium?

Answered by Mr. Davis: In answering this one, let us first of all disregard any complicating effects of oil. Then the answer to the question is an emphatic "no." For example, a stock can be so compounded that it will remain in good condition for more than 1000 hours in steam at 100 lbs. pressure, yet deteriorate rapidly in hot air. Conversely, some stocks are excellent in hot air, yet are very poor in steam. The best example of this is, perhaps, the acrylic ester type of elastomer, which will last for weeks in the air oven at 350°F and outlast any other elastomer, including butyl; yet this acrylic ester elastomer will practically dissolve in steam. Next to the acrylic ester elastomer rubbers, butyl is, of course, outstanding in hot air, yet it swells and softens in steam.

Question—How do you compound nitrile rubber to obtain good flow and knitting of molded stocks?

Answered by Mr. Liddick: Use plasticized rubber, avoid excessive amounts of plasticizers, avoid acid derivative and so-called extender type plasticizers. The scorch characteristics of the acceleration is by far the most important part of the compound to check carefully. Scorchy processing stocks do not flow or knit well in your molds.

Question—Why is there so much confusion and disagreement in the problem of discoloration of light stocks, particularly with respect to the effect of antioxidants?

Answered by Mr. Walker: If the investigator starts out with a standard whose resistance to discoloration is satisfactory and uses the same Fadeometer exposure time, I would think that confusion and disagreement could be avoided. But, of course, there are many materials used in compounds, besides the antioxidant, that will cause various degrees of staining. Smoked sheet is worse than pale crepe and the difference grows more marked the longer the exposure. The longer the prebreak, the more the staining.

Different types of so-called non-staining oils vary in staining properties. Out of twenty-five of such tested, only six were rated as excellent. There is considerable

difference between loading materials. For instance, certain types of whiting vary in staining properties. Clay appears to be consistently good as is finely divided calcium silicate. Two-color combinations such as might be used as a foxing on basketball shoes where white is superimposed on black require, of course, a careful avoidance of staining materials in the black as well as the white.

Question—What will prevent the formation of sulfur crystals in sulfur-bearing natural rubber spreader cements during storage?

Answered by Mr. Clarke: Keep the sulfur content as close to 1.00% as feasible. Do not subject the cements to rapid changes in temperature; remember that the solubility of sulfur in rubber solvent varies widely as the temperature increases or decreases. For instance, at 104°F. the solubility of sulfur in rubber solvent is approximately .75 ozs. per gal., whereas at 68°F. the solubility is approximately .40 ozs. per gal.

Question—Low-grade rubbers are notoriously variable in rate of curing. Can this variability be minimized readily?

Answered by Mr. Davis: Variable rate of curing can be reduced, though not overcome, by adding 0.1 per cent or more of a thiuram accelerator to all such rubber, independent of further acceleration or other tricks in compounding. This will even out fairly well the rate of curing from lot to lot, and will also improve the final quality, in some cases to a remarkable degree.

But there is one more important point not to overlook. Some low-grade rubbers are very deficient in fat acids, and need an abnormally high amount. Hence it is advisable to add a liberal proportion of stearic acid, or its equivalent, in all cases.

However, let me give you another warning. The higher the proportion of stearic acid, the worse is the aging. This, of course, depends in turn on the acceleration; but in any event, use only enough stearic acid to make the rubber cure properly with the acceleration chosen. In other words, the use of stearic acid is a compromise. If you don't use enough you sacrifice original quality; if you use too much you may sacrifice good aging.

Finally, because of this uncertain aging, always use a liberal dose of antioxidant.

If all of us would team together, become more progressive, and refuse to buy rubber by appearance alone, we wouldn't have to resort to all this doctoring of rubber the defects of which we shouldn't have to find out ourselves but should be told about by the broker.

Question—What type of elastomer will last longest in hot air at 300°F.?

Answered by Mr. Capen: Without knowing more about this question I would say butyl. For many years now low pressure molding bags have been constructed of butyl rubber because of its ability to stand up under continued exposure to temperatures of 300°F. The low unsaturation of butyl renders it very resistant to the deteriorating effects of light, heat, oxygen and ozone.

Question—What has become of deproteinized rubber?

Answered by Mr. Couch: Deproteinized rubber is a casualty of World War II. Before the war most of the deproteinized rubber was produced in the Far East in Sumatra. Troubled conditions in Sumatra persisted for a longer time than in other rubber producing areas. This prevented the production of deproteinized rubber for a considerable period after other grades of natural rubber were available and made the supply uncertain. Meanwhile, during the war and afterwards, it was found that GR-S-65-SP gave compounds with nearly as good initial resistance to water as deproteinized natural rubber.

In general, oxidation harms the water resistance of vulcanized rubber compounds. However, GR-S compounds have greater resistance to oxidation than natural rubber compounds and it has been found that GR-S-65-SP compounds show greater retention of water resistance after aging than deproteinized rubber compounds.

A deproteinized rubber insulation, compounded primarily for water resistance, has a water absorption of about 7 mg./sq.in. after 7 days absorption at 70°C. If this same compound is first subjected to a 96 hours oxygen bomb test (to simulate aging) it then will show a water absorption of approximately 16 mg./sq.in. By comparison a similar GR-S-65-SP compound will probably have a water absorption of 10 mg./sq.in. if tested before aging, but after aging may be as low as 14 mg./sq.in. on the water absorption test.

It is anticipated, therefore, that after prolonged service, GR-S-65-SP compounds will actually show better water resistance than similar compounds made with deproteinized rubber, even though initially the deproteinized rubber compounds seem to be slightly better. For this reason, low water absorption grades of GR-S have tended to replace deproteinized rubber for services requiring water resistant insulation. In addition, of course, the supply of GR-S is more reliable and the cost is considerably less.

Question—What is the cause of frosting on rubber goods, and how can it be eliminated?

Answered by Mr. Walker: The type of non-sulfur bloom known as frosting occurs on cured articles during days of high temperature and high humidity. Probably the film of surface rubber breaks down under the action of ozone and exposes the pigment. Frosting is a problem in footwear and we have made a rather thorough investigation of materials that might cause or prevent it. For instance, lower grades of rubber show more of a tendency toward frosting than better grades. A study was made comparing different types of rubber with no pre-break and short and long pre-breaks; also washed against unwashed rubber. No. 1 Ribbed Smoked Sheet washed, unwashed with short and long rubber breaks and no break developed frosting, the unbroken sample showing less of this condition.

The addition of an antioxidant such as trimethyldihydroquinoline or the condensation product of acetone and an amine prevented the frosting of any of the above series. Treating No. 3 Ribbed Smoked Sheets the same way prevented frosting in the unbroken rubber but frosting still occurred in the washed and broken rubber. Coarse Para rubber was prepared in the same manner and results corresponded to that obtained with the No. 3 Ribbed Smoked Sheet. An increase in the percentage of antioxidant over that used with high grade rubbers to prevent frosting will eliminate the condition when using low grade rubbers.

The variation of accelerator within 40% range does not affect frosting seriously although it appeared that the lowest degree of cure did not frost quite as much as the more highly accelerated stocks. Different waxes were investigated to no avail and a large number of antioxidants were tried out. The two antioxidants mentioned above that will stop frosting both stain and therefore cannot be used in the very light colored stocks. They can be used, of course, in black

and the ordinary colors such as the darker blues, reds, browns, etc. If white stocks are superimposed on compounds containing these antioxidants, there will be a certain amount of staining.

Question—What type of GR-S is best for a non-black abrasion-resistant fabric coating compound and what is the best filler?

Answered by Mr. Clarke: Generally speaking, the design of the compound rather than the type of GR-S is of particular importance in building abrasion resistance into a fabric coating compound. However, the new cold rubbers present interesting possibilities and already some work has been done which indicates increased physical properties along the line using hydrated silicon dioxide as a filler.

Other fillers found valuable are the calcium silicates, hard clays and even some of the fine particle sized white pigments. The coumarone-indene resins when used in conjunction with the fillers just mentioned are particularly helpful and fit in well as softeners and tackifiers to improve abrasion. The high styrene-butadiene copolymers when used in conjunction with GR-S improve toughness and abrasion resistance. If the product will take a finish, the nitrocellulose lacquers improve abrasion resistance and the newer vinyl lacquers for GR-S give exceptional results.

Question—Is GR-S preferred in general to natural rubber for processing?

Answered by Mr. Liddick: Generally, GR-S is not preferred to natural rubber for processing. However, the "no" is not as emphatic as in 1943-44. I would guess that in most millrooms through the mixers, natural rubber and GR-S are not far apart in general acceptance. At the calenders and tubers, end uses help for choices. Examples of end uses would be calender embossing or smoothness, tuber dimensions or running speeds, etc. Lack of building tack and poor hot tear resistance are perhaps the two greatest processing differences that will have to be overcome inherently before GR-S will be generally preferred to natural rubber.

Question—Can the tendency of a cured stock to stiffen and become unusable at low temperatures be judged solely by its brittle point?

Answered by Mr. Davis: The direct answer is "no," because brittleness tests do not give any indication whether a stock is any good at temperatures above the brittle point. For example, elastomers which crystallize—and this means neoprene, natural rubber, and butyl—become increasingly stiff with time of exposure, and this stiffening sometimes continues for months. Then again, the brittle point depends on how fast the load is applied; the slower it is applied, the lower the temperature at which the rubber remains flexible.

Finally, brittleness tests give no indication whether, with lowering of temperature, a stock will remain flexible and then stiffen suddenly, or whether it will become progressively stiffer. In other words, two stocks may have the same brittle point, yet one may be flexible at a temperature at which the other is far too hard to be serviceable. In general, it is advisable to use brittleness tests only for comparing stocks of closely similar compositions.

Whoever asked this question asked an interesting one and an important one, as evidenced by the growing literature on the subject, some of it particularly good, in that it reaches beyond the subject of brittleness alone, and teaches us a lot about the physics of elastomers which we didn't know before, and which might do some specification writers a little good.

Question—Has "cold rubber" proved to be superior to standard GR-S in soles and heels?

Answered by Mr. Edsall: Yes, "cold rubber" has proved itself definitely superior to standard GR-S for soles and heels. The main requirement for soles and heels is abrasive resistance; this is the point in which cold rubber has proven at its best. In addition to this, cold rubber has given appreciably more stiffness than regular GR-S, resulting in the reduction of the percentages of higher priced stiffening agents. It has also been found that when the proper types of cold rubber are used, better factory processing results.

Question—What are the chief advantages of "cold rubber" in processing and in physical properties?

Answered by Mr. Fielding: In processing, cold rubber is different from GR-S but it is not clear that it has any real advantage in processing. When GR-S is mixed and repeatedly remilled, its viscosity drops to a fairly low level and in the usual compound we can remill just the right amount to get any desired drop in viscosity. Cold rubber on the other hand levels off at a somewhat higher viscosity. It is conceivable that this might be of advantage if it were desirable to limit the drop in viscosity. In most cases, it is a disadvantage because the leveling off point is a little higher than we might like.

Cold rubber usually mixes and extrudes at a higher temperature than GR-S. This is usually a disadvantage. Cold rubber shrinks more readily after extrusion than GR-S. If the conveyor system does not permit this shrinkage to take place, it may be found that treads, after cutting, shrink more than GR-S treads. On the other hand, with an ideal set-up which permits shrinkage of the tread immediately after leaving the die, it will be found that cold rubber treads, after cutting, shrink less than GR-S and are more stable.

In physical properties, cold rubber is better than GR-S in nearly all respects. The most striking difference is in tensile strength but it is also better in flex life and in resilience. The result of this in tires is better wear and better resistance to both tread cracking and sidewall cracking, and also cooler running tires.

Sarcostat Hydraulic Motor Valve

Developed for automatic operation by thermostats or pressurstats or by liquid level or flow controls, the Sarcostat Hydraulic Motor Valve, manufactured by the Sarco Co., Inc., 350 Fifth Avenue, New York 1, N. Y., provides open-and-shut control. Two wire, normally closed, this new electro-hydraulic motor valve is ready for direct connection to 110-volt AC, 60-cycle current. The Sarcostat valve is constructed to handle steam, water, oil, gas, air, etc. Its gradual opening action protects the piping while quick closing prevents overheating. The valve operator, actuated by hydraulic power, operates single seated valves up to 1½ inch or double seated valves up to 4 inches at 125 psi. It does this by direct thrust without resort to pilots, gears or levers. When the full stroke is used, standard valves will open in 60 seconds and close in 10 seconds. Valve bodies are of brass or iron with union or flanged connections. Various types of valve bodies are available: single seated, needle, piston or double seated. Operators are dust, moisture and fume proof.

Rapid Extraction of Resins from Chilte and Guayule Rubbers

By JOHN W. WOOD and RACHEL J. FANNING

EFFICIENT and rapid extractions of the resinous material from the rubbers of Chilte and Guayule have been obtained in a laboratory internal mixer. Mastication of the rubber takes place during extraction while the solvent is continually renewed. The tensile properties of the deresinated vulcanizates obtained by this method of deresination were found to undergo very little, if any, deterioration as a result of the mastication. They were found to be superior to the tensile properties of the vulcanizates prepared from the rubber samples deresinated without mastication, which required a much greater time of extraction. The improved method of extraction was developed during the war years when it was necessary to make use of as large quantities as possible of all wild rubbers to supplement synthetic rubber, reclaimed rubber, and the natural rubber stockpile.

The Chilte and Guayule rubbers used in this investigation were obtained from Mexico, and had probably already oxidized to some extent as no antioxidant had been added to them during their processing. Blended samples of these rubbers were prepared by mixing several samples on a mill so that blends of 4 kg of each were obtained. Because of the extreme tackiness of the Chilte it was necessary to mix it under a stream of water on a washing mill. The Chilte was, of course, dried to constant weight after this operation.

The rubber hydrocarbon content and the acetone-soluble material of the samples were as follows:

	Chilte	Guayule
Rubber Hydrocarbon	43.7%	69.8%
Acetone Extract	51.8%	19.4%

These compositions are typical of the many samples of these rubbers received during the war years for test at this laboratory. The acetone-extractable material was determined by the method of the American Society of Testing Materials *(1)*, and the rubber hydrocarbon content was obtained by the chromic acid oxidation procedure of Burger, Donaldson, and Baty *(2)*.

Apparatus

The extraction apparatus, as shown in Figure 1, consists of a commercially designed solvent-tight internal mixer made for compounding heavy industrial pastes, to which a siphon system and a glass still have been added. The chamber of the mixer has a working capacity of about 3.5 liters, and extracted approximately 1.3 kg of Chilte or Guayule at a time. The chamber and its two stirring blades are of a stainless steel composition. The two S-shaped blades are rotated in opposite directions at equal speeds by a ¾-h.p. electric motor. Adequate packing glands are provided on the axles of the blades to prevent foreign materials from corroding or abrading the bronze bearings and also the lubricants from contaminating the contents of the mixer. The removable cover (C) of the mixing chamber, which is sealed with a recessed rubber gasket, supports the auxiliary metal condenser (E), which is of Liebig design. The condenser is connected to the mixing chamber by means of a short iron pipe coupling brazed to a hole in the cover.

The chamber and its contents can be heated by passing steam or hot water through a pipe connection (B) to the heating jacket surrounding the mixing chamber. In the present experiments the contents of the chamber were heated sufficiently by rapidly distilling the low-boiling solvent into the chamber. The heating jacket is drained by a pipe connection mounted in the rear (not shown). Connections to the chamber for the overflow line (H) and siphon tube (I) are made by brazing ¼-inch iron pipe nipples to holes of convenient size drilled in the side of the chamber. One of the nipples is flush with the bottom of the chamber, and the other is lo-

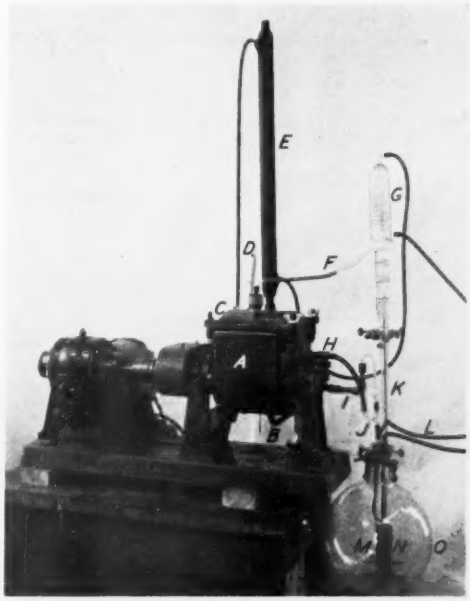

FIG. 1—Internal mixer to which siphon system and glass solvent still have been added.

Note: The work reported in this paper was financed by the Rubber Development Corporation, which supported testing work at the National Bureau of Standards from 1942 to 1945. Both authors were guest workers at the Bureau from the Rubber Development Corporation. Mr. Wood is now with the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Center, Beltsville, Maryland. Mrs. Fanning is with the Rubber Section, National Bureau of Standards, Washington, D.C.

TABLE I—COMPOSITION AND TENSILE PROPERTIES OF DERESINATED CHILTE

Procedure	Time of Deresination (hours)	Acetone-Soluble Material (%)	Rubber Hydrocarbon (%)	Tensile Strength of Vulcanizate (lbs/in.²)
With Mastication...	0	51.8	43.7	no cure
	1	37.7	59.6	2270
	2	6.3	83.8	3650
	4	2.0	87.7	3840
Without Mastication	0	51.8	43.7	no cure
	1	39.2	55.1	1980
	4	14.0	77.6	2970
	8	6.9	83.5	3390
	12	5.7	84.7	3330

cated at a point about two-thirds of the distance to the top. Small discs of 1/16-inch corrosion-resistant metal screen are wedged into recesses at the outlets of the chamber to prevent any loose articles from plugging the siphon and overflow lines.

Premature siphoning from the mixing chamber, which is sometimes caused by variations in the temperature of the room or heater coils, is prevented by the overflow line, which also serves as a vent to the siphon tube. A modified T-tube (J) joins the siphon tube (L) and siphon (M) in the flask. For extractions requiring a flask with a capacity greater than the glass one used in the experiments described here a metal type container is recommended both for economy and to reduce the fire hazard when inflammable solvents are used. Smaller sizes of glass distillation flasks may be used if the siphon tube is eliminated and a continuous overflow system substituted.

The distillation apparatus consists of a Pyrex balloon flask (O) of sufficient capacity to accommodate the volume of the solvent siphoned from the mixing chamber (A). The flask contains a siphon line (M), heater coils (N), and a Pyrex distilling column (K). The siphon line, which has an approximately 8 mm inside diameter, leads to within 1 inch of the bottom of the distilling flask. The heater was prepared by winding on a mandrel 12 turns of corrosion-resistant metal (Monel) tubing having an inside diameter of about 6 mm. The outside diameter of the coils is as large as possible and yet permits the insertion of the heater and the siphon tube through the neck of the distilling flask. The distilling column consists of a length of Pyrex tubing having an inside diameter of 16 mm. The top of this column is sealed to a ground glass joint which connects to the Friedrich condenser (G).

The solvent in the flask is vaporized by passing steam or hot water from the hose connection (L) through the heater. The rate of distillation of the solvent, and hence the rate of siphoning, can be controlled by pumping water from a constant temperature bath through the heater. The distillate is carried into the mixing chamber (A) by the delivery tube (F). This delivery tube, which is equipped with a glass sight tube and drip tip, enters the cover (C) through an iron pipe reducer coupling attached to a tapped hole in the cover by means of a short nipple.

Experimental Procedure

The blended samples of Chilte and Guayule rubbers were divided into 400 gram batches for deresination. Both Chilte and Guayule batches were extracted for periods of 1, 2, and 4 hours, respectively, while the blades of the internal mixer were rotating. The time of each experiment began immediately after the acetone started to distill, at which time the blades in the mixing chamber were started rotating. By adjusting the rate of distillation of the acetone and the height of the siphon tube, siphoning was made to occur every 25 to 30 minutes.

Other batches of Guayule and Chilte were deresinated in the same apparatus without mastication. In these experiments the rotating blades were removed from the mixer. The samples were milled into sheets as thin as possible and then cut into small pieces. The sheets were supported horizontally in the chamber on pieces of galvanized window screens of $\frac{1}{8}$-inch mesh. Blocks were placed between the screens so as to allow free flow of the solvent on both sides of the rubber sheets. Extractions were conducted for periods of 1, 4, 8, and 12 hours, respectively. The 8- and 12-hour periods were necessary to reduce the acetone-soluble material of the rubber to a value comparable with that obtained from the 4-hour extraction period during mastication. All other conditions were the same in both methods.

Attempts were also made to extract the Guayule and Chilte rubbers in a Soxhlet apparatus, but these extractions were less efficient than when conducted in the apparatus described above because of the flow of the rubbers into a mass in the bottom of the Soxhlet cups.

Results

Results of the deresination experiments are given in Tables I and II, and are represented as curves in Figure 2. It can be seen that the efficiency of extraction of the rubbers is much greater when agitation takes place dur-

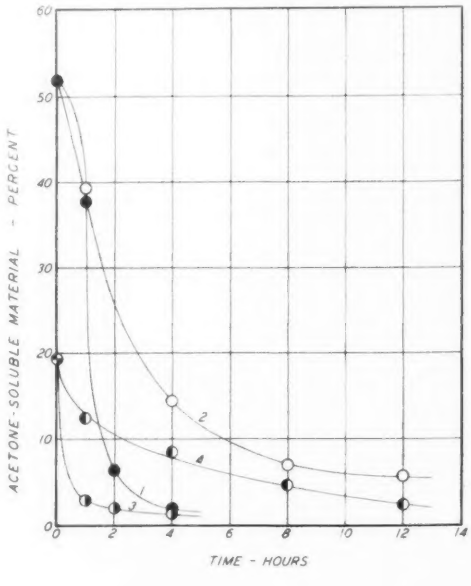

FIG. 2—Comparison between the acetone-soluble content of the rubbers and the time of deresination.

(1) Chilte, with mastication; (2) Chilte, without mastication; (3) Guayule, with mastication; (4) Guayule, without mastication.

ing the extraction. Only two hours in the mixer when aided by the motion of the rotating blades are required to obtain approximately the same amount of deresination for both the Chilte and Guayule rubbers as was obtained in 12 hours without the action of the blades.

The effect of deresination on the tensile strength of the Chilte and Guayule samples was determined by performing vulcanization and tension tests on the rubber after the various periods of deresination. The samples were first freed from acetone by sheeting them thinly on a rubber mixing mill and then drying to constant weight in a vacuum oven maintained at 50°-60°C. and 1-2 mm pressure. The drying time was approximately two hours. The dried deresinates were compounded according to the following formula:

	Parts by Weight
Rubber	100.0
Zinc oxide	6.0
Stearic acid	4.0
Mercaptobenzothiazole	0.5
Sulfur	3.5
Total	114.0

This formula was later recommended by the Crude Rubber Committee of the Rubber Division of the American Chemical Society as an alternate recipe, and designated as ACS-II *(3)*. Undercures, optimum cures, and overcures were prepared from the above compounds at 141°C. (40 pounds per square inch pressure of steam).

The test specimens made from these cures were subjected to tension tests according to the procedure outlined by the American Society for Testing Materials *(1)*. The results of the tension tests on the optimum-cured (according to the tensile strength) vulcanizates of these compounds are shown in Tables I and II and in Figure 3. Each value represents the average obtained from six specimens. The time for optimum cure at 141°C. of the Chilte samples was 15 minutes in nearly all cases. About 30 minutes time was required for the Guayules. The quantity of resin seemed to have little or no effect on the rate of cure.

In general, for each of the methods of removal of resins, the longer the time of extraction the stronger is the resulting rubber vulcanizate. It is interesting to note, however, that for equivalent acetone-soluble material in the rubbers the tensile strengths of the vulcanized deresinates were greater for the samples which were masticated during extraction. This indicates that the agitation process during extraction causes very little, if any, deterioration to take place in the rubber.

The original Guayule vulcanizate was stronger than the Chilte, undoubtedly because of its lower resin content. The deresinated Guayule vulcanizate, however, was found to be weaker than the deresinated Chilte. This can be explained by the fact that the larger quantity of foreign material in the Guayule has a greater effect in weakening the rubber.

The low values of the tensile strengths of the deresinated Guayule given in this paper should not lead one to believe that Guayule itself is an inferior grade of rubber. When it is properly prepared so as to eliminate most of the foreign material, as has been done at the United States Department of Agriculture's Natural Rubber Research Station in Salinas, California, the deresinated Guayule gives tensile properties of the same order of magnitude as those of a good grade of Hevea rubber.

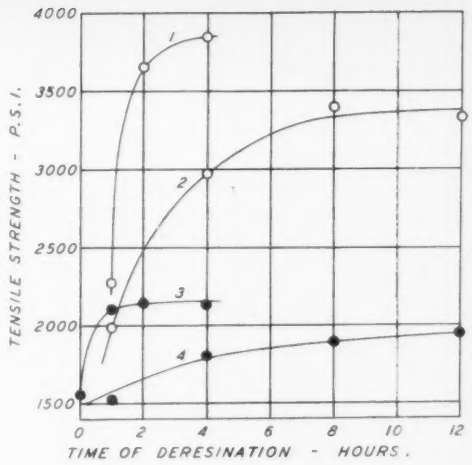

FIG. 3—Tensile strengths of vulcanizates of Chilte and Guayule rubbers after various times of deresination.

(1) Chilte, with mastication; (2) Chilte, without mastication; (3) Guayule, with mastication; (4) Guayule, without mastication.

TABLE II—COMPOSITION AND TENSILE PROPERTIES OF DERESINATED GUAYULE

Procedure	Time of Deresination (hours)	Acetone-Soluble Material (%)	Rubber Hydrocarbon (%)	Tensile Strength of Vulcanizate (lbs/in.²)
With Mastication	0	19.4	69.8	1550
	1	2.8	85.9	2100
	2	2.2	88.6	2140
	4	1.4	88.2	2130
Without Mastication	0	19.4	69.8	1550
	1	12.2	74.5	1520
	4	8.5	77.0	1800
	8	4.8	82.7	1890
	12	2.7	87.1	1940

Summary and Conclusions

A laboratory apparatus has been developed for the rapid and efficient extraction of resins from rubbers containing high percentages of resins. The sample is masticated simultaneously with extraction by a continually-renewed solvent. The tensile properties of deresinated vulcanizates of Guayule and Chilte rubbers show that very little, if any, deterioration takes place as a result of the mastication.

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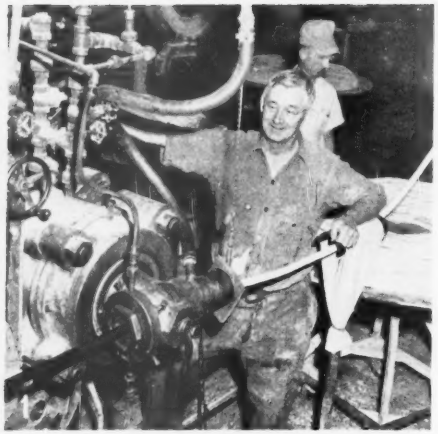
Goodrich Method of Curing Braided Hose



1—The initial step in the curing of braided hose is covering the hose with a rubber cover. Braided hose usually consists of three separate sections—an inner rubber tube, a braided jacket, and the rubber cover. The rubber covering is put on by running the hose through a covering machine which coats it with a cover of the prescribed thickness. From this covering machine the hose drops through a tube to the curing room two floors below.

APPROXIMATELY 200,000 feet of braided hose are manufactured daily at the B. F. Goodrich plant in Akron, Ohio. Goodrich braided hose varies from 3/16 to 1½ inches in diameter and is in general classified into five different types—air hose, acetylene, industrial water, radiator and garden hose. The production, however, also includes specially constructed hose for sprayers and chemicals. In general, all braided hose is made in much the same way. Cotton jackets are braided over rubber tubes which are then covered with a rubber covering and cured. The accompanying series of photographs illustrate the curing process for the braided hose used by Goodrich at the Akron plant.

2—In the curing room, the operator takes the hose as it comes from the covering machine and prepares it for leading. He coils the lengths of hose in loose figure eight piles which feed easily into the lead press. As the hose runs through his hands he examines it and cuts out any defective sections. Then he joins the good pieces together with metal tubes and inflates the entire length with air.

3—A key step in the curing process is the casting of the lead slugs which are used to cover the hose. The slug the operator is pulling out of the cavity illustrated above weighs 1,000 pounds and was cast from molten lead that ranged from 720 to 1,000° F. When they are set, the operator puts the slug on a conveyor that takes it to the lead press for the next step in the production of a typical Goodrich braided hose.

4—The lead press shown above assures the smooth finish of the braided hose. The lead slug being placed in the press will be subjected to 5,000 pounds of pressure and will be forced through a die that presses a lead jacket varying from 3/32 to 3/16-inch which serves as a mold for the hose. In the lower foreground the lead-stiffened hose is coming from the press.

5—The lead-stiffened hose which is still pliable is then rolled on huge drums as it comes from the press as illustrated above. These large drums will hold from 350 to 4,000 feet of hose depending upon the size of the hose which is being processed. The hose, still inflated with air, is then ready for curing. The operator above is reeling the hose on drums which will be taken to the vulcanizers.

6—The drums of hose are cured 10 at a time in a huge vulcanizer. The drums are loaded on a truck by hydraulic lifts and the whole truck is rolled into the vulcanizer where the hose is subjected to steam and hot water curing for 15 to 45 minutes depending on the type of hose. In the photograph above, the operator is preparing to remove a truck load of drums from the vulcanizer.

7—After the hose has been cured, it is cooled by running cold water through it and by sprinkling the drums with cold water. The hose is then pulled from the vulcanizer and run through a stripping machine, where knives remove the lead casing. This lead is returned to the smelters where it is remelted and used again to form lead jackets for uncured hose. After the lead casing has been removed, the cured hose is reeled away for inspection and testing, and then is crated for shipment. The photograph depicts the stripping machine in operation.

Editorials . . .

Rubber Market

THE RISING price of natural rubber in the face of the pending increase in the production of synthetic rubber continues to astound the market experts. The price of spot rubber — for ribbed smoked sheets — this month has already reached the 85-cent a pound mark, the highest price recorded in the past twenty-three years. A high of 41.75 cents was reached in 1927, 88.50 cents in 1926, and 81.21 in 1925. The Stevenson Restriction Scheme was in full bloom during the last year mentioned.

Although there are several basic reasons behind the advancing market, the specific reasons for the daily price fluctuations are anybody's guess. The major reason advanced, and the one most frequently quoted by producer and consumer, is the stockpiling program of the government. There is no argument with the fact that the basic need of increasing the stockpile of natural rubber led to the return of consumption controls and may yet result in additional controls governing specifications of end-products. According to latest reports, and the word "reports" must be emphasized, the government's new stockpiling program is aimed at the accumulation of 1,500,000 long tons of natural rubber, of which some 500,000 tons are already in stock and some 400,000 additional tons will be secured in the next six months.

There is little doubt that the government stockpiling effort has a decided effect on the price situation. However, we are inclined to agree with the current market report of the United Baltic Corporation to the effect that the strength of the present advance is probably due to the fact that dealers, having followed their usual practice of hedging their sales to manufacturers by forward purchases from producers, now find that they have the greatest difficulty in covering their commitments for near shipment, and too many buying orders are chasing too little rubber. In view of the pending increase in the production of synthetic rubber, however, it is surprising to find that futures are only some 20 cents a pound behind spot prices.

The current market situation, coupled with the recent decision of the American government to go all-out on synthetic rubber production, has created a number of international incidents. For example, British rubber producers in the Malayan area threaten an all-out "war" on the U. S. synthetic rubber program and restrictions on the use of natural rubber. They argue that these factors may induce a severe business recession throughout Southeast Asia next year and may further the cause of communism in that part of the world. Some of them threaten to take their case to the "highest authority," although it is difficult to determine what "authority" is indicated.

The rising price of natural rubber, coupled with the supply and demand situation, is causing a good deal of anxiety in France, where the reinstitution of wartime distribution and controls is being considered. According to some French rubber officials, the main hope of the country lies in the possibility of an accord among European nations, the consuming countries on one hand and producing countries on the other, in order to fix prices and to organize allocations of raw materials in case of need. A proposal to this effect was presented by the French Delegation to the Marshall Plan Council early last month. A recent report on the economic problems of Europe issued by the European Economic Organization mentioned rubber as one of the raw materials on which an international and an intra-European accord was needed.

The recent actions of the National Production Authority in limiting consumption of both new and natural rubber does not sit well with the American rubber manufacturing industry which, through the Rubber Manufacturers Association, has entered a sort of official protest. As recorded in detail elsewhere in this issue, the industry has made several recommendations to the government including a modification of NPA Order M-2 so as to permit an over-all industry use of about 39% natural to 61% synthetic rubber, an early step-up in the production of both general purpose synthetic and butyl rubbers, trading of surplus synthetic rubber with other countries for natural rubber, and a new system for accumulating natural rubber for the stockpile.

It is extremely doubtful whether NPA will take any action on the industry's proposals, however it might be so inclined. The Department of Defense is insisting on rapid accumulation of the rubber stockpile. There are many top echelon officers who are firmly convinced that Southeast Asia may soon be the scene of international conflict. These officers insist that current activity on the Korean-Manchurian border is simply diversionary, and that the real trouble will break in Indo-China. Should wide-open warfare break in that area, only a miracle could prevent its spreading to Malaya and Indonesia.

CURRENT NEWS OF THE MONTH

NPA ISSUES REVISED ORDER LIMITING NATURAL USE DURING REMAINDER OF 1950

WILLIAM H. Harrison, Administrator of the National Production Authority, announced on October 20 the issuance of a revised rubber order specifically limiting the use of natural rubber during November and December, 1950. Principal objective of the order, effective as of November 1, is to make more rubber available for the government's stockpile. The revised order, NPA Order M-2, replaces Department of Commerce Order R-1, which has been in effect under provisions of the Rubber Act of 1948. Order M-2, however, continues some of the provisions of the former order, including those requiring that certain amounts of synthetic rubber be used in the manufacture of tires.

Principal new provisions in Order M-2 (1) place specific limits on both total new, as well as total natural rubber, which rubber users may consume during November and December of this year; (2) limit the consumption of natural rubber latex and provide for a set-aside of imported latex for the government stockpile, and (3) establish procedures for formal NPA allocation of synthetic rubber produced in U. S. Government plants.

Last August 25, under a revision of Order R-1, limits were placed on total consumption of new rubber—natural and synthetic combined—for the last four months of this year. These limits were aimed at reducing the civilian consumption of new rubber to an average of approximately 90,000 tons a month. Provisions were made for adjustments in permitted consumption where inequities resulted under the order. Due to the unexpectedly large volume of adjustments, actual total consumption of new rubber during September amounted to about 109,000 tons.

New Consumption Limits

The new limits provide that no person shall consume during either November or December, a total amount of new rubber (including all synthetic, both dry and latex; and all natural, except latex and rubber from guayule) in excess of 84 percent of his base monthly new rubber consumption. New rubber used for Defense Department orders is not included under this limitation.

The base monthly consumption represents the average monthly amount of total new rubber consumed by the user during the year ending last June 30, or as adjusted under provisions of the revised R-1 Order issued last August 25.

The new limits on natural rubber provide that no person shall consume natural rubber (exclusive of natural rubber latex and rubber from guayule) in November in excess of 75 percent, nor in December in excess of 63 percent, of his base monthly natural rubber consumption. Use of natural rubber for Defense Department orders is not covered by these limitations.

The base monthly consumption will represent one-twelfth of the user's actual consumption of natural rubber during the year ending last June 30. If the user's maximum total new rubber consumption for the last four months of this year was adjusted under provisions of the August 25 revision of Order R-1, however, his base monthly natural rubber consumption will be adjusted by the same percentage as his permitted new rubber consumption was changed.

The limitation on natural rubber will not apply to those whose consumption of this commodity does not exceed 15,000 pounds during November or December. No person may, however, consume during the month of November or December, more natural rubber than his actual or adjusted average monthly consumption during the base period.

As for latex, during the fourth quarter of this year, no person shall consume a quantity of natural rubber latex in excess of one-fourth of his consumption during the year ending last June 30. Those who import natural rubber latex during the fourth quarter are required to offer at least 10 percent of these imports to the General Services Administration for purchase for the Government stockpile at current market prices. The consumption of any excess natural rubber latex will be authorized to individual users by NPA on the basis of their consumption pattern of the second calendar quarter of 1950.

Synthetic Rubber Allocation

Under Order M-2, NPA assumes the responsibility of formally allocating available supplies of Government-produced synthetic rubber, which previously was handled on an informal basis by the Office of Rubber Reserve of the Reconstruction Finance Corporation. Present purchase procedures of ORR will, however, continue to be followed.

Under the order of November 1, two separate allocations of Government-produced synthetic rubber will be made by NPA on a quarterly basis: (1) GR-S, dry and latex combined; and (2) Butyl (GR-I). NPA will notify the Office of Rubber Reserve—not the consumer—of the total amount of each type which any person may acquire during the calendar quarter.

Permits to purchase already issued by ORR during the last quarter, and purchases of imported synthetic rubber, will be taken into consideration in determining the GR-S or butyl which may be purchased during the balance of this year. NPA will not allocate by types of GR-S or butyl.

NPA GR-S Allocation

NPA allocation of GR-S will be based on each person's total new rubber consumption, including natural rubber latex, but excluding butyl, during the year ending last June 30, subject to adjustments made by NPA in permitted total new rubber consumption. Allocation of butyl will be made on a somewhat similar basis. In the case of both GR-S and butyl, a reserve will be established by NPA for defense orders, other special programs, and to take care of inequities.

In formulating Order M-2, NPA discussed all matters in detail with industry representatives, including trade association representatives, and consideration was given to their recommendations.

Production Schedules Cutback

In the opinion of trade circles, the new Government order will cause some cutbacks in production schedules. Rubber firms in Akron are still uncertain of what the full impact will be. It was generally believed that at least five-day work weeks will be maintained in most rubber plants with the possibility that work schedules might be increased depending on the size of military orders.

Goodyear Tire & Rubber Co. has informed workers that the order will necessitate some production cutbacks, although the extent of the reductions and which departments will be effected is still unknown. The company said it is certain, however, that November will have fewer working days for employees than either of the preceding two months.

A six-day work week will be maintained by the B. F. Goodrich Co. in Akron with five-day weeks prevailing at plants located in other cities for the present at least, a spokesman said. The company has

been operating six days a week in most of its plants with some Sunday work at several points.

Five-day work weeks also are in effect at the General Tire & Rubber Co. and Seiberling Rubber Co. Employees of the latter company are being informed that five-day schedules are expected to be continued for the balance of the year.

Industry Offers Plan

In a meeting arranged by the Rubber Manufacturers Association, members of the NPA's Rubber Industry Advisory Committee, as well as representatives of the tire manufacturing division of the rubber industry, met on October 24, with officials of the NPA and submitted a planned program for the orderly achievement of security in rubber.

This nation, at this time, officials were told, has on hand and afloat rubber reserves totalling 2,063,000 long tons, physically and immediately available in the form of new, unprocessed natural and synthetic rubber and finished rubber products. Present stocks of natural rubber were estimated at 690,000 long tons, synthetic at 62,000 long tons, and rubber stocks in the form of finished goods—now in use but capable of long essential service in an emergency—aggregating 1,311,000 long tons.

These elements the industry described as the "total stockpile." The most important part of the processed rubber stockpile exists in the form of 250 million tires now rolling on the wheels of 48,700,000 passenger cars, trucks, buses and farm tractors.

Entitled an "Analysis of the 1951 Rubber Problem," one of a series of such studies that have been presented to government agencies from time to time since 1947, the industry's document listed these points as basic to any consideration of national security objectives in rubber:

(1) The building of our strategic stockpile of new rubber to the desired point as quickly as practical.

(2) Planning to assure the necessary capacity and all facilities to make military tires in specified quantities, sizes and types when needed.

(3) A program so balanced as to keep tire labor fully employed in order to maintain the size and conserve the skill of our trained labor force.

(4) Actions shaped to secure and guard quality in the largest segment of our stockpile, consisting of 250 million tires in daily service on the wheels of automobiles, trucks and farm tractors.

(5) Evaluation of and provision for meeting the tire needs of our tremendous civilian motor transportation which is now geared in its operations to a high level labor force and an all-out defense production economy.

Poses Further Questions

By placing the acquisition of new rubber in a new perspective as related to the "total stockpile," the industry spokesmen pinpointed a question that has cropped up frequently since the government began stepping up its rubber program in July. That question has its roots in the fact that this industry, while it has never used as much as 1,200,000 long tons of rubber in a single year, is now looking at a rubber supply available to the United States in 1951 of more than 1,800,000 long tons. Nearly half of that available supply is natural rubber, now selling at a 26-year high of 66 cents a pound. In light of the fact that the three-way pressures of foreign buying, government stockpiling and industry purchasing have held prices at exorbitant levels for months, the industry's question was this: "What happens when the government hits its stockpile target and the strong supporting pressure of its buying program is suddenly withdrawn from the market?"

The industry predicted that a sharp break in rubber price which could result from such a withdrawal could mean: (a) a sharp decline in consumer buying; (b) widespread layoffs of trained personnel; (c) heavy inventory losses to both manufacturers and thousands of small businessmen; (d) losses to the taxpayer on the government stockpile; and (e) major economic upheavals in the producing areas of the Far East.

Industry spokesmen asserted that such repercussions could be avoided by relating government stockpile buying of natural rubber to the amount of rubber available over and above that needed to meet military requirements and to keep at a high performance level the stockpile of processed rubber in the hands of consumers.

By adding only this excess, the government could obtain 561,000 long tons of new rubber for the stockpile next year, the industry estimated. The nation's $700,000,000 synthetic rubber industry is an important factor in these estimates. The government's now rolling reactivation program will make possible the production of 924,000 long tons of synthetic rubber in 1951. Rapidly increasing use of this material will release proportionate quantities of natural rubber to the total stockpile, the industry asserted.

To achieve these objectives, the industry recommended to the government: modification of NPA Order M-2 so as to permit an overall industry use, exclusive of natural latex, of about 39 per cent natural to 61 per cent synthetic rubber; earliest possible step-up in the production of general purpose synthetic and butyl (tube) rubbers; trading of surplus synthetic rubber with other countries for natural rubber; and new rubber stockpile accumulation at the rates proposed in the industry's detailed study of the problem.

Goodrich Winter Service Tire

Following an extensive series of tests on both snow and ice by the Pittsburgh Testing Laboratory, a new tire specially designed for winter service on passenger cars has been announced by the B. F. Goodrich Co., Akron, Ohio. The new tires stopped a car up to 40% faster on ice, and up to 64% faster on snow when compared to standard tires. The tests also indicated that the new tires give 20% more traction on ice and up to 25% more on snow. With a radically different tread, cleats of the tire act as lugs to penetrate snow and mud and give windshield wiper action on ice, packed snow and wet pavement.

NEW WAGE AGREEMENTS SIGNED AVERAGE 12c HOURLY INCREASE

The Goodyear Tire & Rubber Co., on October 20, signed a contract with the United Rubber, Cork, Linoleum, and Plastic Workers of America, CIO, providing for a general wage increase averaging 12 cents an hour. The Goodyear agreement was the fourth pay increase gained by the union since World War II. Shortly after the Goodyear agreement was announced, the B. F. Goodrich Co. and the Firestone Tire & Rubber Co. announced the signing of contracts on approximately the Goodyear basis.

The last of the "big four", U. S. Rubber, was, at this writing, still negotiating a contract with the union in Chicago, Ill. The General Tire & Rubber Co. is also negotiating with the union. Seiberling Rubber Co. signed an agreement with URW on October 28 patterned after the Goodyear contract, and it was expected that most of the remaining companies would soon agree to similar terms.

The "package agreement" effected at Goodyear provided a general increase of 10½c an hour plus 1½c an hour for correcting geographical differentials. The union had sought a basic wage boost of 25c an hour plus allowances for area differentials amounting to about 6c.

Most of the new contracts provided for a modified union shop arrangement which requires all new employees to join the union within 45 days. All present members of the union are required to maintain their membership. Presently employed non-union workers are not required to join the union.

Adopts Safety Precautions

General Tire & Rubber Co. has taken steps to prevent the recurrence of accidents similar to the one on September 26 when three men died of asphyxiation in a carbon black tank. All hatches in the plant have been ordered locked and the keys turned over to officials. All tanks and vats must now be inspected before anyone enters them in the future. The precautions were instituted by George Burkhardt, safety director of the company. The Division of Factories and Buildings of the Ohio Industrial Commission has reported that there was no violation of state laws or regulations in the recent accident. The report indicated that sparks from a blow torch evidently ignited a few bushels of carbon black. This smoldered and gave off carbon monoxide fumes which killed the three men when they entered the tank.

Glove Reconditioning Service

U. S. Industrial Glove Corp., 9350 Roselawn Avenue, Detroit 4, Mich., is offering a new work glove reconditioning service designed for all industries and occupations. The service includes complete renovation, sanitizing and packaging of all types of worn-out fabric and leather gloves and protective clothing. The plan has been thoroughly tested for workability and is proving successful in many industrial plants.

REPORTING OF MASTERBATCHES FURTHER AMPLIFIED BY N.P.A.

In previous correspondence to all compounders and consumers of latex compounds with regard to reporting of masterbatches or latex compounds on Form IC-3410, the Commerce Department quoted the definition of "consumption" from Allocation Order R-1 (Section 338.71 e) and underlined the exception, i.e., "except where any of these materials are used in the preparation of masterbatches or compounds prepared for use in the manufacture of finished products."

At the same time it was indicated that compounding does not constitute consumption except in the event that such compound, in itself, is a finished product or shelf item for merchandising through wholesale and retail trade channels.

The Industry Operations Bureau of the National Production Authority of the Commerce Department, now charged with rubber operations, has further amplified this distinction in respect to masterbatches, compounds or mixed stocks purchased from a supplier as follows:

(a) If the rubber masterbatch or compound is used by any company without the addition of accelerators, vulcanizing ingredients, etc., the consumption of the dry rubber content of such masterbatch or compound should not be reported by said company, but should be reported by the masterbatcher or compounder.

(b) If the rubber masterbatch or compound as used by any company is changed by such company by adding accelerators or vulcanizing agents, etc., such company should report the consumption of the dry rubber content on Form IC-3410. In this event, the masterbatcher or compounder would report only the shipment of such material.

Of course, companies who both make rubber masterbatches or compounds and also use such masterbatches or compounds, should report the consumption of the dry rubber content, monthly, on Form IC-3410.

Analysis By End-Product

The Bureau does not require analysis of rubber consumption by end-product, but it does require complete reporting of rubber consumption regardless of the end-product manufactured. Considerable quantities of rubber materials, masterbatches or compounds, normally are used in the production of textile, leather, paper, plastics, etc., industries. It has been assumed in some quarters that the consumption of such rubber in producing non-rubber products need not be reported. Consumption reports should include rubber consumption to produce both rubber products and non-rubber products, provided it complies with the above criteria.

Rubber consumption, by whomsoever reported on Form IC-3410, should be classified by type of rubber as indicated on that form. All in the above, of course, is subject to the provisions of Section 338.75 in Allocation Order R-1, excusing companies from monthly reporting if their consumption and stocks are less than the minimums therein stated.

Coming Events

Nov. 26-Dec. 1. A.S.M.E., Annual Meeting, New York, N. Y.

Dec. 8. Detroit Rubber & Plastics Group, Xmas Party, Detroit-Leland Hotel, Detroit.

Dec. 11. Northern Calif. Rubber Group, Xmas Party, The Willows, Orinda, Calif.

Dec. 14-15. SPI Plastics Film, Sheeting and Coated Fabrics Conference, Commodore Hotel, New York.

Dec. 15. Chicago Rubber Group, Xmas Party, Morrison Hotel, Chicago.

Dec. 15. N. Y. Rubber Group, Xmas Party, Henry Hudson Hotel, New York.

Dec. 15. Boston Rubber Group, Xmas Party, Somerset Hotel, Boston.

Dec. 19. Buffalo Rubber Group, Xmas Party, Elks Club, Buffalo, N. Y.

Jan. 26, 1951. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Feb. 28-Mar. 1-2, 1951. Rubber Division, A.C.S., Spring Meeting, Washington, D.C.

Sept. 3-7, 1951. American Chemical Society, 75th Anniversary Jubilee Meeting, New York.

Titanium Oxide Plant for Brazil

Brazil will refine its own titanium oxide for use in the rubber, paint and other industries by early next year, according to a recent announcement by the Brazilian Government Trade Bureau. A plant for the purpose is being built in Sao Paulo by the Companhia Quimica Industrial, CIL, S.A. It will produce enough titanium oxide to supply all of Brazil's domestic demand. Output, as planned, will be about 10 tons daily of pure titanium oxide. By-products will include synthetic iron oxide which finds use in the rubber and other industries. It was said that the plant will be the first of its kind in either Central or South America. An announcement said the new plant would also produce about 50 tons of sulfuric acid daily, and would probably process barium sulfate ore.

Faultless Rubber Elects Officers

The stockholders of the Faultless Rubber Co. at a recent meeting in Ashland, Ohio, elected a board of directors for the company who subsequently met and elected the following officers: *President*, T. W. Miller, Jr.; *Vice-President in Charge of Sales*, Western Wiles; *Secretary and Treasurer*, George A. Meiler; *Assistant Treasurer*, R. L. Charlton; *Assistant Secretary*, R. C. Johnson. The board of directors named at the stockholders' meeting include: N. R. Duell, C. D. Hubler, W. A. McAfee, G. A. Meiler, T. W. Miller, Jr., J. C. Myers, and W. Wiles.

SCRAP RUBBER INSTITUTE HEARS TALKS BY OTTIGNON AND ABRAMS

The Scrap Rubber Institute of the National Association of Waste Material Dealers, Inc., heard a number of interesting talks at the annual fall meeting held this year on October 6 at the Hotel Traymore in Atlantic City, N. J. In addition to discussions of industry problems, L. N. Larsen (Muehlstein), chairman of the Traffic Committee, told the members of the efforts being made to extend freight rate reductions into other than "official territories." The Traffic Committee recently obtained a 15% rate reduction for scrap rubber in certain areas.

"The Effect of Extremely Low Scrap Tire Prices is Causing an Inflated Scrap Market" was the subject of a discussion held at the meeting. Roger Ottignon (Nat E. Berzen) and George Abrams (U. S. Rubber Reclaiming) presented the views of the dealer and the reclaimer, respectively.

Mr. Ottignon said that the cumulative effect of drastically reducing inventories and permitting the price structure to reach abnormally low levels had the effect of causing an inflated scrap market the moment heavy demand set in for the replenishing of inventories. The speaker stated that the scrap collectors and dealers are well able and equipped to take care of the entire needs of the rubber reclaiming industry.

Scrap-Reclaim Relationship

Mr. Abrams noted that there is no such thing as a reclaimer's or a scrap rubber dealer's point of view. Both the reclaimer and the dealer will differ as to the price for a particular type of scrap, but in the long run a prosperous reclaiming industry means a prosperous scrap rubber industry, and the other way around. Mr. Abrams said that the subject of the discussion, as worded, implies that the reclaimers were in a position to set prices so low as to tie up supply, force shippers out of business, and disrupt normal channels of collection. While it is true that low prices will do just that, he said, price is merely an indication of the balance between supply and demand. In itself, price cannot cause an inflated or depressed scrap rubber market.

In addition to the aforementioned discussion, the meeting featured an open forum on "Problems of Enforcing Shipments of Scrap Dealers Contracts." The forum was led by Ben Gordon (A. Schulman) and Sidney Freedman (Muehlstein).

Olin Buys Interest in Harwid

Olin Industries, Inc., East Alton, Ill., has purchased a "substantial interest" in the Harwid Co., Cambridge, Mass., manufacturer of polyethylene film. John M. Olin, president of Olin Industries, said that Olin's interest in polyethylene film will complement its sale of cellophane. Mr. Olin, in a joint announcement with Harry H. Gilbert, chairman of the board of the Harwid company, and P. Widmer Hubbs, president of Harwid, said there will be no change in present Harwid management or sales distribution.

FIRST REACTIVATED PLANT OPENS AS SYNTHETIC PROBLEMS MOUNT

The first of the nation's all-purpose synthetic rubber plants to be reactivated under the Government's expanded rubber program started production on October 12, twenty days ahead of schedule. The plant, located at Port Neches, Texas, was originally designed with a production capacity of 60,000 long tons a year. However, U. S. Rubber Co., the newly-designated operator, has thoroughly renovated the plant so that it will produce more than 72,000 long tons a year when operating at peak load.

Production during October was expected to total 1,500 long tons. Output will increase gradually until peak capacity of 6,000 long tons a month or 72,000 tons a year is reached by December 1. Reactivation and modernization of the Port Neches plant was accomplished at a total cost of $1,030,000. Of this total, $530,000 was utilized for modernization and $500,000 for actual reactivation.

Synthetic Overproduction Feared

Meanwhile, mobilization planners are beginning to show some concern over the prospect that the fast build-up of synthetic rubber production is going to give the United States a good deal more synthetic than it can use. By March or April of 1951, the supply of all rubber will probably be running close to a 2,000,000-ton annual rate. Of this sum, 850,000 tons will be from Government-owned synthetic plants, 750,000 tons of natural rubber from Asia, 100,000 tons from makers of specialty synthetics, and a large but undetermined amount from reclaimers.

According to industry spokesmen, only about 1,200,000 tons of natural and synthetic rubber can be used during the year. If steel shortages cut back automobile production, even less can be utilized. Of this amount, manufacturers state that no more than 720,000 tons can be synthetic without taking the "economically wasteful course" of reducing the quality of its rubber products.

It is known that the production of synthetic rubber cannot be turned off and on at will. Manufacturers, for their part, cannot alter their product "mix" readily. Therefore, the probable surplus of synthetic rubber next year has been estimated at 100,000 tons, leaving specialty types and reclaim out of the picture.

To alleviate this condition, trade sources predict that the GR-S plant at Institute, W. Va., will probably never go into full-scale production, and may even be cancelled altogether. Doubt has also been expressed that the GR-S plant at Louisville, Ky., will ever be reactivated.

Plastics Makers Comment

At the annual national conference of the Society of the Plastics Industry held on October 19 at Swampscott, Mass., plastics makers said that the smaller concerns in the field face bankruptcy unless the Government acts quickly to limit its synthetic rubber program so as to make more styrene available.

Those most concerned with the short supply of styrene are the injection molders group, which must depend on styrene as a raw material essential for their production activities. There are approximately 1,400 of these injection molding plants throughout the country.

At the meetings in Swampscott, the plastics makers recommended that the Government use greater quantities of reclaimed rubber to replace part of the new rubber now included in the program. It was also recommended that the percentage of styrene in GR-S be reduced, and that time be allowed for the construction of additional benzene units. The plastics makers also asked for a rate of stockpiling that would permit more natural rubber to flow to the rubber industry.

Push Synthetic Benzene

The present acute shortage of benzene may shortly be eased by new facilities now being planned for synthetic production from petroleum. Several processes for the synthetic production of benzene have been developed, though as yet commercial production is on a small scale. The latest method developed utilizes the "platforming process," which was discovered by Dr. Vladimir Haensel and has hitherto, during the past year, been used to improve the quality of motor gasoline.

Dr. Gustav Egloff, director of research for Universal Oil Products Co. of Chicago, Ill., announced recently that Universal has started commercial production of benzene from petroleum after intensive studies revealed that the platforming process will successfully produce benzene in practically unlimited quantities.

Although Dr. Egloff's statement did not reveal extent of present production, it is reported that Universal has developed facilities, using the platforming process, for production of about 8,000,000 gallons of benzene a year, and already has obtained contracts for substantial production.

In addition, Pan American Petroleum and Shell Oil are engaged in commercial production of benzene from petroleum, though as yet on only a limited scale. With the price of coke oven benzol now up to 30c a gallon, costs in synthetic production are believed close to the price of the coke oven by-product supply. Pan American's present capacity is about 5,000,000 gallons of synthetic benzene a year, and Shell's approximately the same.

Alcohol Quotas Established

In order to assure the availability of butadiene for the production of synthetic rubber, the Government has taken steps to provide sufficient supplies of alcohol. The whiskey distilling industry was informed by the Office of Rubber Reserve at a meeting on October 19 that the synthetic rubber program requirements for industrial alcohol would call for only about 40,000,000 gallons of domestic production over the next year. Of the total of 150,000,000 gallons overall requirements for synthetic rubber as now foreseen, about 110,000,000 gallons or more is expected to be obtained from France.

The whiskey distillers who have permits for the production of alcohol were asked to start supplying alcohol for the first of the butadiene units reactivated at Kobuta, Penna., by November 20 in the amount of 2,500,000 gallons, and to have another 10,000,000 gallons available for delivery by the end of January for other butadiene units that will be coming into operation.

Five of the seven butadiene units in the synthetic rubber industry are being reactivated, the first being ready to start operations about November 15 and the others coming in at various stages until about January 15, when all will be in operation.

Only a part of the whiskey distilling industry can participate in the program at this time, due to a provision of existing law which prohibits whiskey distillers from producing beverage and industrial alcohol in the same plant. The law requires that such production be in separate plants and that the distillers obtain permits for the production of industrial alcohol. Legislation to revise the law to make unnecessary this separation of operations will be presented to Congress when it reconvenes, it is understood.

General Industry Comments

While some organizations and individuals were calling for some lessening of activity in the synthetic rubber program, others were urging the maximum output of synthetic. Foremost among these was Harvey S. Firestone, Jr., chairman of the Firestone Tire & Rubber Co. Mr. Firestone, upon his arrival from Europe on October 22, said that the production of "maximum quantities" of synthetic was vital to our defense program.

It will be recalled that at a conference called by the Munitions Board in Washington on July 25, Mr. Firestone noted that four to six months were required to reopen a stand-by synthetic rubber plant and urged that at least two more facilities be put in operation. Production has been hampered by a shortage of benzene and by scarcities of skilled workers.

Last month, on his departure for Europe, where he attended the International Automobile Salon in Paris and conferred with Firestone executives, distributors and dealers, Mr. Firestone suggested that German synthetic rubber plants be reopened. Talks are going on at present between the Allies, who stopped output of buna in 1945, and the West German producers, on a possible go-ahead for such production.

On his recent return to this country, Mr. Firestone said that "in addition to helping us meet our own military and civilian needs, an expanded synthetic rubber output should enable us to supply synthetic rubber to our foreign friends which would put them in a position to contribute to our vital natural rubber stockpile by the substitution of synthetic rubber for natural rubber in their own products.

"Furthermore, we could expedite the desired result of making more synthetic rubber available abroad by rehabilitating under our control the synthetic rubber plants in Germany.

"It seems to me particularly unfortunate that the German synthetic rubber plant in

the Russian zone has been producing at full capacity since the end of the war, while the synthetic plants in other zones are still idle. Our Government should lease these plants and arrange for their operation at the earliest possible moment.

Cites Trend Toward Synthetic

Synthetic rubber, once a wartime substitute, is fast becoming the preferred raw material for the rubber industry with its use promising to surpass natural rubber both in the immediate and long-term future, Harry E. Humphreys, Jr., president of the U. S. Rubber Co., said recently.

The outlook for the remainder of 1950 and the entire year 1951, Mr. Humphreys said, is toward the use of more and more synthetic. Synthetic rubber will account for about 48% of the country's total consumption in the remainder of this year. Next year, it may rise to more than 60%, he said.

The immediate reason for the transition is that the Government is buying large tonnages of natural rubber for stockpile purposes. Over the long-term, however, synthetic rubber will continue to make steady inroads on the natural product because it's capabilities are limited only by the scientist's ingenuity. Natural rubber depends, in large part, on the whim of nature, Mr. Humphreys observed.

In another sidelight on the synthetic rubber program, William S. Richardson, president of the B. F. Goodrich Chemical Co., observed that an estimated 5,000 new jobs will be created by the Government's decision to reopen all of the nation's facilities for producing synthetic rubber.

The program for producing 929,000 long tons of synthetic rubber of all types, scheduled to be accomplished early in 1951, will put an additional demand on American industry's technical manpower, Mr. Richardson said. However, industry met the urgent demands for rubber in volume during World War II and can do so again, he stated.

Guayule Gains Are Reported

Slow but significant progress is being made toward the production of natural rubber within the boundaries of the United States, according to a recent report from plant scientists of the U. S. Department of Agriculture. New strains of guayule, the result of an intensive breeding program begun in 1942 and now conducted at Salinas, Calif., yield from 25 to 40% more rubber than the best of the guayules produced during World War II. Study of crops now indicates that guayule has important possibilities for dry-land farming. It appears that the plant may make a suitable crop on some 2,000,000 acres in Texas in the low rainfall area where cleared land is devoted to pasture, corn, cotton, peanuts, etc. It is believed that seedlings of the productive new strains will produce about 1200 pounds of rubber per acre in five growing years. The weed problem when guayule is grown under irrigation has apparently been licked by oil sprays, but it is not known whether these sprays can be used effectively in dry land farming.

Reactivated Copolymer Plants

Location	*Type*	*Rated Capacity*	*Present Operator*	*Original Operator*
Port Neches	GR-S	60,000	U. S. Rubber Co.	Firestone Tire & Rubber Co.
Los Angeles	GR-S	75,000	Minnesota Mining & Mfg. Co. and Pacific Rubber Co.	Goodyear Synthetic Rubber Corp., and U. S. Rubber Co.
Louisville	GR-S	30,000	Kentucky Synthetic Rubber Corp.	National Synthetic Rubber Corp.
Institute	GR-S	90,000	B. F. Goodrich Chemical Co.	U. S. Rubber Co.
Akron	GR-S	30,000	Goodyear Synthetic Rubber Corp.	Goodyear Synthetic Rubber Corp.
Baton Rouge	GR-I	38,000	Esso Standard Oil Co.	Standard Oil Co. of New Jersey

Reactivated Raw Materials Plants

Louisville	Alcohol-Butadiene	40,000	Carbide & Carbon Chemicals Co.	Carbide & Carbon Chemicals Co.
Kobuta	Alcohol-Butadiene	40,000	Koppers Co.	Koppers Co.
Los Angeles	Petroleum-Butadiene	25,000	Shell Chemical Co.	Shell Union Oil Co.
El Segundo	Petroleum-Butadiene	18,000	Standard Oil Co. of Calif.	Standard Oil Co. of Calif.
Baton Rouge	Petroleum-Butadiene	15,000	Copolymer Corp.	Standard Oil Co. of N. J.
Houston	Petroleum-Butadiene	50,000	Sinclair Rubber Inc.	Sinclair Rubber, Inc.

Note: The plants listed herewith are those ordered reactivated by the Office of Rubber Reserve since the first reactivation announcement on July 7, 1950. Practically all of them are currently in the reactivation stage only and the capacity figures shown are those expected to be reached when the plants are in full operation.

Lee Rubber & Tire Expanding

Lee Rubber & Tire Corp. of Conshohocken, Penna., has announced it is in the midst of an expansion program which will add about 10% to its productive capacity at a cost of $750,000. Expansion of operations will be accomplished through the construction of two new buildings, together with additional milling and curing equipment. The company also plans to install a turbo-generator set to develop about 20% of its own power. This will be so designed that it will permit the use of steam passing through the turbo-generator for vulcanizing tires. The company at present has capacity at its Conshohocken plant for producing almost two million tires and tubes a year. Its Republic Division in Youngstown, Ohio, where mechanical rubber goods are made, can turn out about 24,000,000 pounds of products annually.

Organize New Scrap Company

George Woloch, who served as secretary-treasurer of A. Schulman, Inc., since the foundation of that company twenty-two years ago, has organized George Woloch & Co., 61 Broadway, New York 6, N. Y., to deal in scrap rubber and plastics as well as crude rubber. Before joining the Schulman firm, Mr. Woloch spent three years with H. Muehlstein & Co., so that his experience in the scrap rubber field covers a twenty-five year period. He has been active in plastics scrap for the past ten years. The phone number of the new firm is WHitehall 4-2670.

Philadelphia Section Meeting

The Philadelphia Section of the American Chemical Society is presently preparing for its fourth "Meeting-in-Minature," to be held on January 18, 1951. Research papers to be presented on this occasion are invited. Each paper will be allotted 15-20 minutes. The full-day program will include at least six sections: analytical, biological, industrial, organic, petroleum, and physical chemistry. Contributors to any of these sections should send a 200-word informative abstract to Dr. William P. Ratchford, Eastern Regional Research Laboratory, Philadelphia 18, Penna. These abstracts will be published and presented at the meeting and by mail. A number of special features for the meeting are being arranged and will be announced in the near future.

Increasing Film Production

Dewey & Almy Chemical Co., Cambridge 40, Mass., has announced plans for the outlay of $500,000 for expanding operations at its Lockport, N. Y., plant to increase production of Cry-O-Rap plastic film. Cry-O-Rap is said to be finding increasing use as a food packaging agent as well as for protection of clothing and household articles. The expansion will be largely in the form of additional machinery which is expected to remove bottlenecks and to double production. Some slight increase in employment is expected when the program is completed in June, 1951.

INTERNATIONAL RUBBER MEETING IN CLEVELAND IS HUGE SUCCESS

The 57th Meeting of the Division of Rubber Chemistry of the American Chemical Society, which was held at the Hotel Cleveland in Cleveland, Ohio, from October 11 to 13, was one of the finest meetings yet held by the Division. Known as an International Meeting, the first sponsored by the Division, approximately 50 foreign delegates representing the world's foremost rubber technological organizations were in attendance.

The official registration totalled 1139, the third largest in the history of the Division, exceeded only by the registration of 1219 at the Spring Meeting held in New York City in 1944 and 1145 at the Fall Meeting held in the same city in 1943. An attendance of approximately 1000 was recorded at the Spring Meeting of 1947 which was also held in Cleveland.

The meeting featured the presentation of 44 technical papers, a luncheon-meeting of the 25-Year Club, presentation of the Charles Goodyear Medal to Dr. C. C. Davis, chief chemist of the Boston Woven Hose & Rubber Co., and delivery of the Goodyear Lecture by Dr. Davis, election of officers for the 1950-51 season, the annual suppliers' cocktail party, and the usual divisional banquet.

Because of the large number of technical papers, more than half of which were contributed by the foreign delegates, split sessions were held on Thursday afternoon, October 12, and Friday morning, October 13. One of the scheduled papers, that on "Evaluation of Diene Type Elastomers for Oil and Solvent Resistance and Low Temperature Flexibility," was withdrawn. Abstracts of all the papers were published in our September, 1950, issue. Most of the papers presented will be published in full in the January or February, 1951, issue of *Industrial & Engineering Chemistry*, official journal of the American Chemical Society.

Election of 1950-51 Officers

Election of officers for the 1950-51 season, the results of which were announced during the business meeting by Arnold Davis (American Cyanamid) of the Tellers Committee, was as follows: *Chairman*, John H. Fielding, head of the compounding division, central development department, Armstrong Rubber Co., West Haven, Conn.; *Vice-Chairman*, Waldo L. Semon, director of pioneering research, B. F. Goodrich Co., Akron, Ohio; *Secretary*, Charles R. Haynes, manager of rubber service, Binney & Smith Co., New York; *Treasurer*, C. W. Christensen, sales manager, Rubber Service Laboratories Division, Monsanto Chemical Co.

Sectional directors elected for two-year terms included the following: *Akron*, Henry F. Palmer (Kentucky Synthetic Rubber); *Boston*, James C. Walton (Boston Woven Hose); *Buffalo*, E. C. Siverson (Buffalo Weaving & Belting); *Chicago*, Francis S. Frost, Jr. (Frost Rubber Works); *Los Angeles*, R. E. Bitter (Goodrich Chemical); *New York*, M. R. Buffington (Lea Fabrics).

Sectional directors elected for one-year terms included the following: *Connecticut*, William J. O'Brien (Seamless Rubber); *Detroit*, G. P. Hollingsworth (Minnesota Mining); *Northern California*, G. S. Ramsey (Grove Regulator); *Philadelphia*, Russell Kurtz (DuPont); *Rhode Island*, E. L. Hanna (Davol Rubber); *Southern Ohio*, R. A. Clark (Battelle Memorial Institute); *Washington, D. C.*, Norman Bekkedahl (Bureau of Standards). In addition, William J. Sparks (Standard Oil Development), who received the second highest number of votes for vice-chairman, becomes a director-at-large for a one-year period.

Meeting of 25-Year Club

Approximately 165 members and guests attended the meeting of the Division's 25-Year Club, held in the Hotel Cleveland at noon on October 11. Dr. R. P. Dinsmore (Goodyear) presided as chairman, and after briefly reviewing the history of the club extended a warm welcome to the foreign guests attending the luncheon. These guests were individually introduced table by table.

It was moved and seconded that a committee be appointed to determine the proper scope of the club's activities, namely, whether it should continue on a social scale only or whether its activities should be broadened on a more serious scale. The following were named members of this committee: Earl Babcock (Firestone), H. A. Winkelmann (Dryden Rubber), and Bruce Silver (N. J. Zinc). A motion to have a permanent secretary-treasurer was also approved, and Earl Busenberg (Goodrich) was unanimously elected to the post.

Dr. Dinsmore again outlined the qualifications necessary for membership in the 25-Year Club, namely, twenty-five years of experience in the rubber industry. Any individual meeting that qualification can become a member of the club by contacting the new secretary-treasurer, Mr. Busenberg. Those members and guests with the longest records of activity in the industry present at the meeting were called upon to stand up and take a bow. Those with more than 50 years of such experience included George Oenslager, formerly with Goodrich, William Kavenagh, of Goodyear, and Fordyce Jones, of the Reliable Rubber Co. of England.

Active Business Session Held

The business meeting of the Division was held toward the end of the technical session on Thursday morning, October 12, with Dr. F. W. Stavely, of Firestone, the retiring chairman presiding. In opening this meeting, Dr. Stavely announced that in accordance with a request from the parent society Dr. Dinsmore had prepared a history of the Rubber Division for presentation at the 75th Anniversary Meeting of the A.C.S. which will be held in New York next fall.

It was also announced that the Executive Committee had approved a budget of $23,400 for next year, that a change in annual dues was pending but was being held up until the necessary change is made in the by-laws of the Division, and that membership cards would be furnished for the first time in the near future. As usual, a minute's silence was observed for those members who had died since the previous meeting. These included James J. Boyle of the Fort Belvoir (Va.) Engineering Corps and J. E. Whittenberg of Firestone.

A report by the Membership Committee, delivered by L. V. Cooper (Firestone), indicated that total membership was now 2725, of which 343 were associate members. Mr. Cooper stated that at least 100 members had been secured in the three months preceding the meeting, and suggested that a permanent membership committee should be maintained, at least insofar as section chairmen were concerned. E. H. Krismann (DuPont), reporting for the Auditing Committee, said that the committee had checked the books and found them in good shape.

Mr. Fielding, the newly-elected chairman, was then introduced and given the floor. Mr. Fielding pointed out that the Rubber Division would hold a meeting of its own in Washington, D. C., on February 28, March 1 and 2, 1951, with the Washington Rubber Group as sponsors, and would meet with the parent society in New York during the week of September 3, 1951, with the New York Rubber Group as sponsors. The latter meeting will be the Jubilee 75th Anniversary Meeting of the A.C.S. He made an appeal for papers for both meetings, pointing out that because of the time element abstracts of papers intended for presentation at the Washington meeting had to be in the hands of the secretary early in January while those planned for presentation at the New York meeting had to be on hand early in April.

Mr. Fielding further explained that the program for the Jubilee Meeting next fall will consist entirely of symposiums. Five such symposiums have been planned for the Rubber Division's session. These symposiums and the chairmen appointed for each of them are as follows: *Synthetic Rubber: Preparation and Properties*, W. B. Reynolds (Phillips Chemical) and J. D. D'Ianni (Goodyear); *Latex*, L. A. Wohler (Firestone); *Dynamic Properties*, J. W. Liska (Firestone); *Compounding*, A. E. Juve (Goodrich); *Cracking*, G. R. Cuthbertson (U. S. Rubber).

Banquet Held at Carter

The divisional banquet, which was preceded by the annual suppliers' cocktail party, was held in the Rainbow Room of the Hotel Carter on Thursday evening, October 12, with 1,006 in attendance. After an excellent dinner, served in record time, Dr. Stavely introduced all those seated on the dais, after which Dr. Dinsmore extended an official welcome to all of the foreign delegates, all of whom were guests of the Division at the banquet.

A response to this welcome was made by Dr. W. J. S. Naunton, director of the rubber laboratory of Imperial Chemical Industries, Ltd., leader of the British delegation. In his usual crisp and witty style, Dr. Nauntan thanked the Rubber Division for its courtesies and cooperation where the foreign delegates were concerned, and then in his capacity as a vice-president and official delegate of the Institution of the Rubber Industry, presented a silver inkstand to Dr. Stavely as a token of

esteem from the I.R.I. Dr. Stavely accepted the gift in the name of the Rubber Division.

One of the major highlights of the banquet was the presentation of the Charles Goodyear Medal, scroll and honorarium to Dr. Davis, the 1950 Goodyear Lecturer. Prior to this presentation, the activities of the medalist were reviewed by J. C. Walton, one of his co-workers at the Boston Woven Hose & Rubber Co. Mr. Walton, who has been associated with Dr. Davis for some 27 years, spoke of the medalist's reputation as a trainer of young men, his work on reclaimed rubber, specifications, and tests, his role in the development of the Bierer-Davis oxygen bomb, his appreciation of the fine arts, and his two major hobbies, hiking and climbing. He also referred to his work as editor of *Rubber Chemistry & Technology* since 1928, this work being abetted by the fact that Dr. Davis speaks three foreign languages fluently and reads six of them.

The medalist was presented to the chairman, Dr. Stavely, by Howard I. Cramer (Sharples Chemicals), and the medal, scroll and honorarium were presented by the chairman to Dr. Davis, who made a brief speech of acceptance during which he pointed out that on a per capita basis British, French, Dutch and other rubber technologists had made a bigger contribution to the technical rubber literature than have American rubber chemists.

Final speaker at the banquet was Walter A. Murphy, editor of *Industrial & Engineering Chemistry*, who brought official greetings from the officers of the American Chemical Society. The final portion of the banquet was the presentation of an excellent variety of vaudeville acts, one of the best yet presented for the entertainment of the Division.

Davis Gives Goodyear Lecture

In his Goodyear Lecture, the official title of which was "Some of the Real Pioneers of the Rubber Industry" and which was presented during the technical session on the morning of Thursday, October 12, Dr. Davis dwelt upon the outstanding contributions to the rubber industry since the time of Goodyear and on some of the almost forgotten pioneers who were responsible for these achievements, particularly Rowley, Marks, Price, Boggs, Molony and Moureu. Among the subjects covered were vulcanization, plantation rubber, acceleration, reinforcement, reclaimed rubber, dependable aging, and synthetic elastomers.

Dr. Davis first briefly reviewed the work on vulcanization of Charles Goodyear, and decried the fact that so little public recognition has been granted the inventor. He pointed out that even today there is no placard, no marker, no indication whatever on the house in Woburn, Mass., to tell the passerby of its historic value, and expressed the wish that the Rubber Division might some day be in a position to acquire the historic dwelling and perhaps bequeath it to some organization such as the Society for the Preservation of New England Antiquities.

One by one the Goodyear Lecturer recounted the exploits of the pioneers and briefly emphasized the importance of each discovery to modern day methods of processing rubber. Coming to the development of the synthetic elastomers, he reviewed the work of Bouchardat who started working with isoprene as far back as 1879, and applauded the accomplishments which have resulted in Thiokol, neoprene, GR-S, butyl rubber, and the nitrile rubbers. Discussing the GR-S polymers, he stated that even cold rubber is probably only a forerunner of still better elastomers.

In concluding his lecture, Dr. Davis emphasized the importance of cooperation to the well-being of the entire rubber manufacturing fraternity. He compared the secrecy which existed in the industry only twenty-five years ago with the open, voluntary cooperation which exists today between technologists and their companies. He gave several anecdotes from his personal book of knowledge to illustrate the closing of the secrecy gap and stated that cooperation deserves a considerable share of the credit "for the sensational advances which have been made in wartime and in peace . . . and for the growth, prosperity and prestige of our own Rubber Division."

John H. Fielding

Newly-Elected Chairman of the Rubber Division, ACS.

Arrangements at Meeting

The details of the International Meeting at Cleveland were expertly handled and every function went off smoothly. This was due in large part to the operations of the Local Arrangements Committee which was headed by Amos W. Oakleaf (Phillips Chemical) as chairman, and included Cecil A. Smith (N. J. Zinc) as vice-chairman and C. W. Christensen (Monsanto) in an advisory capacity.

Other members of the committee, in charge of various functions, included the following: *Registration,* E. H. Krismann (DuPont); *Program,* William Von Fischer (Case Institute); *Finance,* Henry F. Palmer (Kentucky Synthetic Rubber); *25-Year Club,* R. P. Dinsmore (Goodyear); *Cocktail Party,* Allyn I. Brandt (Goodrich Chemical); *Banquet,* F. A. Bonstedt (Sid Richardson Carbon); *Foreign Liaison,* C. A. Hemingway; *Publicity,* Ralph F. Wolf (Columbia Chemical).

RUBBER CONSUMPTION IN 1950 ESTIMATED AT 1,190,000 TONS

William S. Richardson, president of the B. F. Goodrich Chemical Co., Cleveland 15, Ohio, estimated before a recent meeting of the New York Society of Security Analysts that rubber consumption in the United States in 1950 will be about 1,190,000 long tons. For 1951, he anticipates about an equal consumption, with more going to the military.

This year about 45% of rubber consumption will be synthetic against 55% crude, Mr. Richardson forecast. In 1949 73% of rubber consumed was synthetic. Sales for the full year 1950 will be substantially over 1949, according to Mr. Richardson, with July the peak month. Sales outlook for 1951 could show a smaller dollar volume, due to government buying. This year, only around 2% of sales went to the military.

The outlook for the use of synthetic rubber, according to Mr. Richardson, is excellent for all products with the possible exception of heavy truck tires. The effect of the use of synthetic fibres instead of cotton goods in the manufacture of tires could stabilize the market, although the outlook for crude rubber remains cloudy. The possibility of further rises in tire prices was admitted by Mr. Richardson because of the current high price of spot rubber.

Boston Holds Compounding Panel

The Fall Meeting of the Boston Rubber Group held at the Somerset Hotel in Boston, Mass. on October 20, featured a panel discussion on rubber compounding problems. John T. Blake (Simplex Wire) acted as chairman for the meeting. Panel members included: J. H. Fielding, Armstrong Rubber), B. H. Capen (Tyer Rubber), C. C. Davis (Boston Woven Hose), W. H. Couch (Simplex Wire), W. E. Walker (Hood Rubber), L. R. Clarke (Haartz-Mason), H. S. Liddick (Davidson Rubber), and W. S. Edsall (Goodyear). A full report on the meeting, the questions presented to the panel and the answers given appear elsewhere in this issue.

Form Latex & Rubber, Inc.

Latex and Rubber, Inc., has been formed in Baltimore, Md., and has acquired the latex handling, storage and laboratory facilities formerly owned by Latex Distributors, Inc., at 1075 Hull Street, Baltimore 30, Md. Latex & Rubber, Inc., will deal in SocTex centrifuged hevea latex, Socfin Plastorub, a low viscosity natural rubber, and Socfin Tensorub, a high tensile natural rubber. The telephone number of the new organization is Plaza 7602. Arthur Nolan is general manager of the new company.

The Plastics Division of the Monsanto Chemical Co., Springfield, Mass., is offering the "Comparator", a handy reference guide which gives comparative costs of styrene and aluminum, of phenolic and zinc, and of any other combination of plastics and other materials, at the mere turn of two handy dials.

WASHINGTON HOLDS BANQUET AND HEARS TALK BY STROHM

The twentieth meeting and third annual banquet of the Washington Rubber Group were held at the Hotel Washington in Washington, D. C., on October 24. The meeting attracted approximately 200 members and guests, the largest turn-out recorded to date by the group, the youngest of the local rubber groups. The banquet was preceded by a social hour, the cost of which was covered by donations received from industry.

At the banquet, T. R. Scanlan (Gates Rubber), chairman of the Program Committee, thanked the donors for making the social hour possible and then turned the gavel over to Harold Wirth (Firestone), the toastmaster of the evening. Mr. Wirth briefly reviewed the history of the group and then introduced Roy J. Devereaux (Goodrich), the retiring president. Mr. Devereaux made a short talk during which he indicated the group's membership had reached 207. Brief talks were also given by others associated with the progress of the group, including T. A. Werkenthin (Bureau of Ships) and Norman Bekkedahl (Bureau of Standards).

The toastmaster then introduced Dr. Warren Stubblebine (Office of the Quartermaster General), the newly-elected president for the 1950-51 season. The latter made a short acceptance speech and then introduced the other newly-elected officers, including the following: *Vice-President*, T. R. Scanlan (Gates Rubber); *Secretary*, Richard E. Harmon (Connecticut Hard Rubber); *Treasurer*, E. G. Holt (Commerce Dept.); *Recording Secretary*, Ethel Levene (Bureau of Ships). A number of guests from abroad were also introduced.

Speaks on Far East

The speaker of the evening was John L. Strohm, well-known author, editor, foreign correspondent and world traveler, who was introduced by Warren Lockwood, director of the Natural Rubber Bureau. Mr. Strohm, one of the few foreign correspondents to visit Russia and other Iron Curtain countries, showed approximately an hour's uncensored color movies he took behind the iron curtain and others taken on a trip this year to the Far East, including Malaya, Indonesia, Ceylon, Burma and India. He accompanied the movie films with a staccato running account of the background of each view.

For the most part, the films indicated, as did Mr. Strohm's comments, that both the Middle and Far East were still centuries behind the United States insofar as their agricultural pursuits and standard of living is concerned. He intimated that Japan was one of the bright spots in the Far East and the one nation in that area most apt to effectively combat the growing inroads being made by communism. He warned that most of the countries in the Far East, because of their abject poverty, were ripe for communism, and that every effort should be expended to improve the conditions which currently exist.

Brazilian Consumption Rises

According to a report by the Brazilian Rubber Commission, the use of natural rubber is growing faster in Brazil than anywhere else in the world. The report stated that the use of natural rubber in Brazil was up by 524% over ten years ago, while the amount used in the United States actually declined nearly 4% during the same period. In total monthly use, however, Brazil was still far behind the United States, Britain, the Soviet Union and France. In rate of increase, Brazil's nearest competitor was the Soviet Union which increased use of natural rubber by 273%. Monthly consumption averaged by Brazil last year, the Commission said, was 1,610 tons, about the same as India's, but only about one-thirtieth of that of the United States.

NO. CALIFORNIA HEARS SIBLEY TALK ON ORGANIC ACCELERATORS

The September 28 meeting of the Northern California Rubber Group held at the Elk's Club in Berkeley, Calif., featured an address by Dr. R. L. Sibley of the Monsanto Chemical Co., Nitro, W. Va. Dr. Sibley spoke on "Organic Accelerators." His talk was followed by the presentation of a colored film entitled "Rubber Reborn," shown through the courtesy of the Midwest Rubber Reclaiming Co.

In his address, Dr. Sibley stated that although many types of specialty chemical products are marketed for use in rubber, only one compound of sulfur, other than sulfur chloride, is at present available as a vulcanizing agent of rubber mixes. Following Ostromislensky, several investigators have described work in this field but apparently none of the various products reported have been adopted commercially.

Organic Sulfides Tested

Sixteen different organic sulfides were tested in natural rubber stocks and one, namely morpholine disulfide, was particularly outstanding in effect. This compound contains 27.1% sulfur and apparently all the sulfur content is made available for vulcanization at temperatures of 266° F. or higher.

Stocks of satisfactory non-scorching tendencies result from the use of a fractional part of the normal sulfur requirement (approximately one-third the normal amount) together with approximately 1.75 to 2.25% of morpholine disulfide to 100 parts of rubber. Best results are obtained with mercaptobenzothiazole type acceleration. Equally good results were obtained with GR-S and Hycar OR rubbers but the compound is slow curing with GR-I rubber. In all rubbers, lower moduli of elasticity are experienced in the shorter times of cure, Dr. Sibley concluded.

NO. CALIFORNIA HEARS VODRA TALK ON CALCIUM CARBONATES

Approximately 60 members and guests attended the October 26th meeting of the Northern California Rubber Group held at the Elk's Club in Berkeley, Calif. Principal speaker of the evening was Vic Vodra, sales manager of calcium carbonates for the Wyandotte Chemical Co., Wyandotte, Mich. Mr. Vodra spoke on the subject "Saving Money With Calcium Carbonates." The meeting was designated "Past Chairmens' Night," with all seven previous chairmen of the group in attendance.

Don Good (American Rubber Mfg.), 1949 chairman, acted as chairman for the evening and introduced the other six chairmen who delivered brief addresses. Herman Jordon (DuPont), 1943 chairman, spoke of the need for supplying needed information for wartime compounding. Leonard Boller (Coast Paints), 1944 chairman, spoke of the necessary exchange of information during wartime. Russell Kettering (Oliver Tire), 1945 chairman, recounted early experience and problems in relation to the compounding of GR-S.

Leonard Shaeffer (American Rubber Mfg.), 1946 chairman, related the success of the group in passing from the war emergency to post-war production. George Farwell, 1947 chairman, reminisced of the pleasant memories associated with group activities. Ross Morris (Mare Island Naval Shipyard), 1948 chairman, commented upon the large number of enthusiastic workers in the group.

Calcium Carbonate Types

In his talk, Mr. Vodra emphasized the fact that there are many grades of calcium carbonates which may be used to give different desired properties in rubber in the same way that there are many grades of carbon black which impart various physical properties to rubber. Grading of calcium carbonates is usually accomplished by particle size, ranging from coarse limestones to fine precipitated carbonates. Rubber is stiffened by the coarse materials while the fine materials have a reinforcing effect, he said.

By taking advantage of the reinforcing values of the fine sized carbonates, it is possible to make scarce rubber go further by increased loadings. Microns of 0.1 and smaller impart increased tensile strengths with corresponding increases in tear resistance, Mr. Vodra said. Carbonates can be used to advantage in both white and colored stocks with materials of 0.2 to 0.5 micron size having the greatest hiding power. The selection of the proper carbonate will insure decided savings on any given job, he concluded.

Rubber Planting School to Open

A school of rubber planting, first of its kind in the United Kingdom, will soon be started in Hampshire, England, by a veteran Malayan planter who is returning to England on retirement. The projected course will last from 6 to 8 weeks, and will feature all aspects of rubber planting.

N. Y. GROUP MEETING FEATURES ELECTIONS, TALKS AND TRIBUTE

Approximately 300 members and guests attended the Fall Meeting of the New York Rubber Group, held on October 20 at the Henry Hudson Hotel in New York City. The meeting featured the presentation of two technical papers, election of officers for 1951, and the payment of a special tribute to B. B. Wilson *(India Rubber World)* and P. P. Pinto (RUBBER AGE) for their long service to the group.

The election of officers for 1951, based on a slate presented by the Nominating Committee, resulted in the following: *Chairman*, M. R. Buffington (Lea Fabrics); *Vice-Chairman*, J. A. S. Corrigal (Vanderbilt); *Secretary-Treasurer*, B. B. Wilson *(India Rubber World)*; *Sergeant-at-Arms*, C. E. Hicks *(Hatfield Wire & Cable)*. The following were elected as members of the Executive Committee for three-year terms: E. W. Schwartz (Southern Clays), J. S. Boyle (N. J. Wood Finishing), M. H. Savage (Circle Wire & Cable), and J. D. Fagan (Muehlstein).

As customary, the retiring chairman, D. E. Jones (American Hard Rubber) and the retiring secretary-treasurer, P. P. Pinto, become ex-officio members of the Executive Committee. The Nominating Committee included F. E. Traflet (Pequanoc Rubber) as chairman, and P. P. Murawski (DuPont), A. R. Lewis (Vulcan Proofing), and F. S. Conover (Manhattan Rubber).

Technical Talks Presented

In opening the technical session in the afternoon, which preceded the usual dinner and entertainment, D. E. Jones (American Hard Rubber), chairman of the group, announced that despite the efforts of the Papers Committee, not a single entry had been received for the Prize Essay Contest for 1950. In accordance with previous plans, the winning papers in this contests were to have been presented at the Fall Meeting. Similar contests, with better results, were sponsored by the group in 1939, 1940 and 1941.

The first speaker at the technical session was John M. Bierer, vice-president of the Boston Woven Hose & Rubber Co., Cambridge, Mass., who delivered an instructive, well-illustrated talk on "Continuous Vulcanization," in which he discussed the newest equipment and methods for the continuous curing of belting, tiling and similar products. In opening his talk Mr. Bierer stated there were three basic factors with which rubber manufacturers were concerned, namely, labor, rubber itself, and variation of vulcanization. The bulk of his talk was devoted to the latter subject.

Mr. Bierer traced developments in machinery and equipment for the vulcanization of belting and similar products since the days of Goodyear and Hancock, when the screw press was used for intermittent vulcanization of such products. Specific developments in hydraulic presses were traced through the patent literature, with the faults of each unit emphasized. In like vein the speaker followed the development of continuous curing equipment from the work by Parmalee in 1859, Gray in 1903, and others, to the development of the Rotocure unit by the Boston Woven Hose & Rubber Co. in recent years. The numerous difficulties encountered in the perfection of the present day unit, particularly in securing a satisfactory endless steel band, were enumerated by the speaker. (EDITOR'S NOTE: An article based on Mr. Bierer's talk will appear in an early issue of RUBBER AGE.)

The bowl presented by the New York Rubber Group to Peter P. Pinto in recognition of his long and faithful service to the group is pictured above.

The second speaker was Wyman Goss, phenolic development engineer, Chemical Division, General Electric Co., Pittsfield, Mass. Mr. Goss talked on "Impact Tests of Rubber-Phenolics and Straight Phenolic Compounds," describing the results of a simulated drop hammer test developed by the General Electric Laboratories to determine the abuse resistance of rubber-phenolic stocks as compared with straight phenolic stocks containing various fillers, including wood flour, cotton flock, fabric and asbestos fiber. The data indicated the rubber-phenolic stocks withstood shock loads of from 1½ to 8 times that of the straight phenolics. (EDITOR'S NOTE: An article based on Mr. Goss' talk will also appear in an early issue of RUBBER AGE).

Tribute to Wilson and Pinto

An unexpected event occurred during the evening session of the meeting. At the conclusion of the dinner, Chairman Jones announced that at a meeting of the Executive Committee earlier this year it was decided to have the group pay some recognition to the work done by Messrs. Wilson and Pinto for their untiring efforts in behalf of the group. These men have alternated in the capacity of secretary-treasurer of the group almost since it was organized in 1928 and year in and year out have handled the innumerable details concerned with meetings, papers, contests, outings, prizes, etc. In recognition of this activity, the group presented large Paul Revere sterling silver bowls, properly inscribed, to each of the two men. The bowls are inscribed as follows:

Presented to
PETER P. PINTO
(B. B. WILSON)
in grateful appreciation of a
quarter century of voluntary and
selfless effort in behalf of
THE NEW YORK RUBBER GROUP
OCTOBER 20, 1950

Standing acclaim was given to both men by the entire membership.

Entertainment was provided during the cocktail hour preceding dinner by an accordionist, as well as during the dinner itself, while Joseph Mezo, widely-known humorist, was the after-dinner speaker. Mr. Mezo was introduced as a "celebrated South American statesman and industrialist," and preceded his regular humorous talk with "a message for all rubber men." Mr. Mezo's real status as a humorist was not recognized by the audience for several minutes.

German Group Visiting U. S.

A group of German rubber technologists, selected by the Wirtschaftsverband der Deutschen Kautschuk-Industrie E.V. (Association of the German Rubber Industry), is currently visiting the United States under the auspices of the Technical Assistance Division of the Economic Cooperation Administration. The purpose of the group, like that of similar groups being brought to this country by ECA, is to seek data on standardization, specialization and simplification in rubber manufacture. An extensive series of plant and laboratory visits has been planned for the group covering the period of October 30 to November 30.

The group is divided into tire and mechanical goods units. Members of the Tire Unit include Erich Bobeth (Phoenix, Hamburg), Willi Kraemer (Dunlop, Hanau), and Theo. R. Schmauser (Engelbert, Aachen). The Mechanical Goods Unit includes Fritz Paasche (Cloth, Köln), Heinz Vieweg (Metzeler, München), Wilhelm Kunst (Vorwerk u. Sahn, Wuppertal), and Guenther Schwiersch (Paquag, Dusseldorf). Dr. Alfred Titze and Dr. Detlev Schmidt, general manager and technical director, respectively, of the German rubber association, are also associated with the group, which is under the direction of William Fitzgerald of the ECA Technical Assistance Division.

Any member of the group can be reached in care of Mr. Fitzgerald at the Washington, D. C., headquarters of ECA, or at the Hotel Vanderbilt in New York City on or about November 30. A luncheon was tendered to the entire group by the Rubber Manufacturers Association in New York City on October 27.

QMC To Rate Defense Orders

Quartermaster Corps purchasing installations have been authorized to apply priority ratings in certain existing and future contracts for supply of Quartermaster items. Special "DO" (defense order) symbols have been assigned to various items of Quartermaster supply under authority of National Production Authority Regulation No. 2, dated October 3, and this rating may be assigned to contracts by the Quartermaster purchasing agencies. Use of the "DO" symbol under the priority system will be of value in permitting contractors holding contracts so designated to obtain raw material and components necessary in fabricating the items of Quartermaster procurement.

BUFFALO GROUP HEARS TAPP ON RECENT POLYMER DEVELOPMENTS

The October 17 meeting of the Buffalo Rubber Group held at the Hotel Westbrook, in Buffalo, N. Y., was addressed by Dr. J. S. Tapp, assistant manager of the Research and Development Division of the Copolymer Corp., Ltd., Sarnia, Ont., Canada. Dr. Tapp spoke on the subject "Recent Polymer Developments." The group was also addressed by Frederick Koethen of the Goetz Petro Chemical Corp., Niagara Falls, N. Y. Mr. Koethen spoke on "A History of the Niagara Frontier Chemical Industry."

In his address, Dr. Tapp stated that in producing chemical rubber from butadiene and styrene, a better product is made at temperatures lower than the conventional polymerization temperature of 122° F. Dr. Tapp described the development of the Polymer Corporation's "cold rubber" product, called "Krylene." The speaker explained that the term "cold rubber" has reference in this instance only to the temperature of polymerization.

Since temperatures are most frequently judged to be "hot" or "cold" simply by reference to body temperature, it is easy to understand why polymerization at 41° F. is said to be "cold." It will be apparent, he said, that there is theoretically plenty of room to go to still lower temperature, but practical considerations indicate that the difficulties may outweigh the advantages.

In order to produce "cold rubber," refrigeration capacity already on the property at the Polymer plant was diverted to cooling one-half of the installed reactor capacity, the speaker stated. A few of the difficulties encountered in going from pilot plant scale to full scale production were outlined. This phase was described with particular reference to the operations as they had been performed with the mutual formula. Activator and catalyst variables were outlined and a brief reference was made to an activator catalyst system of Polymer Corporation's development.

Dr. Tapp also described the mechanism of polymerization and put forward some ideas on why temperature as an environment could be expected to favorably modify the polymer molecule produced.

Improved Clay Bagging Process

A 20% saving in shipping and storage space is said to result from the new "De-Aerating" method for flattening bagged clay for the rubber industry, recently developed by the J. M. Huber Corp. in its Graniteville, S. C., plant. "De-Aerating" is a mechanical process for driving excess air out of filled clay bags by passing them between compression roller belts. Bags are said to come out flatter, more compact, and are easier to handle for palletizing. Inventory counting is also simplified. The process produces a better seal by tightly closing the bag valves. As pressure is applied, weak bags give way, thus saving later inconveniences. The characteristics of the clays are not changed in any way by the process. Merely a space-saving device, use of the method will save 12 cubic feet per ton of clay.

Effect of Braking on Tires

According to experiments by the Air Materiel Command of the U. S. Air Force, the application of brakes on an airplane landing at 100 miles per hour will melt the tires. Using a B-26 attack bomber of World War II vintage with the wings clipped, the Air Materiel Command found that when brakes were applied on concrete runways at 100 miles an hour, the tires smoke, the bomber skids forward at 150 feet a second, the rubber on the tires melts, and all grip on the concrete is just about lost. Five or six 300-foot skids and the rubber wears right down to the casing. Through the skid tests, aircraft engineers intend to learn exactly what happens between the airplane tire and the ground at the precise instant of landing. In addition, the engineers want to construct lighter and smaller landing gears. The tests also indicate the manner in which airplane tires stand up under landing stresses. Tests thus far have been confined to skid tests on dry concrete. Others are to follow on wet concrete, dry and wet sod, macadam and other surfaces.

DETROIT HEARS WINKELMANN ON AGING OF AUTOMOTIVE RUBBER

Dr. H. A. Winkelmann, technical director of the Dryden Rubber Division of the Sheller Manufacturing Co., Chicago 24, Ill., addressed the October 6th meeting of the Detroit Rubber and Plastics Group, held at the Detroit-Leland Hotel in Detroit, Mich. Dr. Winklemann, who is vice-chairman of the SAE-ASTM Technical Committee on Automotive Rubber, spoke on "Weather Aging of Automotive Rubber."

In his address the speaker noted that vitamin E improves the resistance of rubber compounds to weather aging cracks. Vitamin E, he said, was one of the best of the chemical additives tested. Other interesting data presented showed the effect of processing on the cracking tendencies of various rubber compositions. Dr. Winkelmann also discussed the study of fractionation of waxes and the resultant effect on aging. The speaker illustrated his talk with a number of slides and distributed tabular matter and a resume of the subject covered to members of the group.

Interesting Contest Held

During the entertainment portion of the meeting, the approximately 250 members who attended the meeting participated in a "Know Your Neighbor" contest. Prizes were awarded for the ability to identify members of the golf outing party last June as they were shown in slides and movies taken by R. Chilton (Permalastic Products) and Dr. E. Tillotson (Wayne University).

AKRON GROUP HEARS NEWTON ON PLANTATION CONDITIONS IN ASIA

Approximately 320 members and guests of the Akron Rubber Group attended the Fall Meeting held on October 20 at the Mayflower Hotel, Akron, Ohio. Due to an accident, A. G. Hopcraft of the Cleveland Worm & Gear Co. was unable to make a scheduled address on "How Can the Purchasing Agent Help the Production Men, Development Men and the Salesmen." Instead, the group heard an address by Dr. R. G. Newton of the British Rubber Producers' Research Association of London, England.

Dr. Newton described the precariousness of present-day life on rubber plantations in Malaya and Indo-China. In addition to showing films of bud-grafting, latex gathering and rubber preparation, Dr. Newton also showed several reels taken during a 3,000 mile trip through Malaya and Indo-China early this summer.

The speaker stated that due to terrorist activity, the road from Saigon to the rubber plantations in the interior is open only one day a week when it can be heavily patrolled. In spite of the guard towers at short intervals and the frequent patrols that traverse the road, Dr. Newton reported that it is unsafe for a vehicle to stop between villages and the films covering this portion of the trip reflected this condition.

During the meeting, the overseas delegates attending the ISO meeting in the United States were introduced to the members of the Akron Group. Dr. Waldo Semon, vice-chairman of the Rubber Division of the American Chemical Society, was introduced and made a plea for an intensified membership campaign.

E. L. Stangor (DuPont), chairman of the group, announced the appointment of a Nominating Committee consisting of C. A. Ritchie (Goodrich), Henry F. Palmer (Kentucky Synthetic Rubber), and Jack R. Moore (Harwick Standard Chemical). The next meeting of the group will be held on February 2, 1951, and will feature a symposium on new compounding materials.

Akron University Receives Gift

Equipment for the rubber and plastics laboratory in the new Knight Chemistry Building at the University of Akron at Akron, Ohio, will be purchased from a $25,000 gift received from Mrs. Curtis J. Harwick, chairman of the board of the Harwick Standard Chemical Company. The money was given in memory of the late Curtis J. Harwick, founder of the chemical concern which bears his name and a prominent alumnus of the school. President H. E. Simmons of the University said, "This is a wonderful contribution. Mr. Harwick was one of our most loyal alumni. His interest in the university started when he was a chemistry student in my classes and carried through his entire life." President Simmons also announced that the rubber and plastics laboratories would be named in honor of Mr. Harwick. This will take place formally at the dedication of the new chemistry building on January 18th, 1951, during the university's annual Founder's Day exercises.

CASING PRODUCTION IN AUGUST DROPS 1.10% FROM JULY TOTALS

Casing production in August totaled 8,172,929 units, 1.10% less than the 8,263,546 casings produced in the previous month, according to a recent report by the Rubber Manufacturers Association. Of the total number of casings produced in August, 6,994,685 were of the passenger type and 1,178,244 were truck and bus casings, compared with 7,103,496 and 1,160,050, respectively, produced in July.

Shipments of all types of casings in August amounted to 10,609,556 units, including 9,040,326 passenger and 1,569,230 truck and bus casings. In the previous month, a total of 12,040,389 casings were shipped, including 10,421,758 passenger and 1,618,631 truck and bus casings.

As of August 31, 1950, there were 4,801,281 casings of all types on hand, including 3,835,638 passenger casings and 965,643 truck and bus types. As of July 31, 1950, there were 7,004,700 casings on hand of which 5,690,302 were passenger casings and 1,314,398 were truck and bus casings.

Passenger and truck and bus tubes produced in August totaled 7,243,695 units, against the 6,916,496 tubes produced in July. A total of 9,208,677 tubes were shipped in August, compared with the 9,629,335 tubes shipped in the previous month. At the end of August, there were 6,619,472 tubes of all types on hand, while at the end of the previous month there were 8,422,233 tubes available.

Opens Washington Branch Office

Dow Corning Corp., Midland, Mich., has announced the appointment of Earle J. Smith as manager of the company's newly-opened branch office at 711 Fourteenth St., N.W., Washington, D. C. Mr. Smith received his Master's Degree from the University of Nebraska in 1940. Before taking a position as research chemist with Dow Corning in 1945, he was an instructor in chemistry at Michigan State College and research chemist with the Chemical Warfare Department of the Dow Chemical Co. Mr. Smith has been closely associated with the development of many silicone products, particularly resinous silicones. In 1946, he was assigned to the company's New York office as a technical consultant. The new Washington office is expected to provide an efficient advisory service on the potentialities of silicone components in military equipment.

DuPont RR-10 Reclaiming Aid

The Rubber Chemicals Department of E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del., has announced the development of RR-10, a new and powerful reclaiming aid. The addition of a small amount of the product is said to speed the reclaiming cycle and produce smooth, soft reclaims with good tack. RR-10 is effective in either acid or pan processes and can be used with rubber, GR-S or mixed scrap. It is often possible to use less of the ordinary reclaiming oils and softeners when RR-10 is used, thus improving the qualities of the reclaim.

General Fund Buys Radio Net

Salaried workers of the General Tire & Rubber Co., Akron, Ohio, have purchased the extensive Don Lee radio network on the West Coast for $12,230,000 as an investment for their pension fund. General Tire is not a newcomer to the radio field. Since 1942 it has owned and operated the Yankee radio network in New England, the world's fifth largest chain. Thomas O'Neil, vice-president of the company, has run the Yankee network and will take charge of the Don Lee chain in the new arrangement. The Don Lee purchase is subject to the final approval of the Federal Communications Commission. The Don Lee network is the western outlet for the Mutual Broadcasting System, of which the Yankee network is also a part. Mr. O'Neil is vice-chairman of the Mutual Broadcasting System. In acquiring the West Coast network, employees of General Tire got about $5,000,000 in cash or securities, a Hollywood mansion, five radio stations, one television station, and contracts with 41 other radio stations. These assets go into the employee's pension fund.

Activator for Butyl Compounds

Vulklor, a new activator recommended by the company with G-M-F for butyl compounding, has been introduced by the Naugatuck Chemical Division of U. S. Rubber Co., Naugatuck, Conn. The new activator is said to offer the following advantages: faster curing, higher modulus, superior aging, non-blooming and non-tarnishing, moderate processing safety, and lower acceleration cost. A compounding research report on Vulklor is available on request to the company.

Industrial Rayon Raises Prices

Industrial Rayon Corp., Union Commerce Building, Cleveland 14, Ohio, has raised the prices of its high tenacity tire yarns effective immediately. The 1100/480 high tenacity Tyron yarn on beams now sells for 63c a pound. Type 1650/720 sells for 62c a pound.

CHICAGO RUBBER GROUP HEARS CROCKER SPEAK ON LATEX FOAM

Approximately 140 members and guests of the Chicago Rubber Group attended the October 6 meeting held at the Morrison Hotel in Chicago, Ill. Principal speaker of the evening was E. Charlton Crocker, chemical engineer for the General Latex & Chemical Corp., Cambridge, Mass. Mr. Crocker spoke on "The Manufacture of Latex Foam."

Mr. Crocker presented a broad picture on the development of the latex foam industry since the end of World War II, and the possibilities for future expansion. He pointed out that the expansion of the foam industry is partially due to the introduction of continuous mixing machines.

Mr. Crocker discussed the various types of latices which have been used in the foam industry. By the use of GR-S Type V or GR-S Type VII, companies using natural latex have been able to extend their available supplies. Recently a new "cold process" GR-S latex, X-547, has met with some acceptance as an extender of natural latex. Improvements in neoprene latex compounding have also broadened the use of this synthetic. A question and answer period followed the speech.

The next meeting of the group will be held on November 17th in the Terrace Casino of the Morrison Hotel. Mr. Gordon L. Hostetter, executive vice-president of the Employers Association of Chicago, will speak on "Human Liberty."

Marbon Names Distributors

Marbon Corp., Gary, Ind., has announced the appointment of the Anchor Chemical Co., Ltd., of Manchester, England, as the exclusive distributor for the Ty-Ply line of rubber-to-metal vulcanizing adhesives for all countries outside of the United States and Canada. Anchor Chemical maintains a New York office under the name of British Anchor Chemical Corp., Ltd., at 11 West 42nd St. Dillons Chemical Co., Ltd., with offices at 137 Wellington Street West, Toronto, Ont., Canada, and 410 St. Nicholas Street, Montreal, Que., Canada, has been appointed exclusive distributors for Ty-Ply adhesives and for Marbon's high styrene resin, Marbon 8000, for the Dominion of Canada. Harwick Standard Chemical Co., 1248 Wholesale Street, Los Angeles 21, Calif., has been appointed the sole distributor for Ty-Ply adhesives and Marbon 8000 and 9200, a new paint resin, on the West Coast.

Caldwell Co. Moves Offices

Effective October 1, the Caldwell Co., formerly at 1014 First National Tower, Akron 8, Ohio, moved to 94 Cutler Parkway, Akron. The mailing address of the company is: Post Office Box 6, East Akron Station, Akron 5, Ohio. The new telephone number is: Stadium 1244. The company's change of address also affects the Akron address of its principals: Thompson Weinman & Co., Harmon Color Works, Inc., Synthetic Products Co., and the Chemical Division of the Marathon Corp.

CONSIDERABLE PROGRESS MADE AT AKRON MEETING OF ISO RUBBER GROUP

Considerable progress on international rubber standards was recorded by ISO Technical Committee 45 on Rubber of the International Organization for Standardization at the meeting held at the Mayflower Hotel in Akron, Ohio, from October 16 to 20, inclusive. The objective of the organization, which is recognized by the United Nations as an affiliated body, is to promote the development of standards in the world with a view to facilitating international exchange of goods and services and to develop mutual cooperation in the sphere of scientific and technological activity.

Ten sessions devoted to various interests were held during the week and over 100 resolutions were made and approved. It must be emphasized that the proposals made at these meetings are draft proposals only and go through a series of four steps before they assume official status. However, when the final report of the meeting is approved within the next few months by member nations of the committee, each member nation may adopt whatever resolutions were passed at the meeting which they consider desirable for inclusion in their own national standards.

Member nations of ISO Technical Committee 45 on Rubber include the following: Australia, Austria, Belgium, France, Hungary, Italy, Netherlands, Switzerland, United Kingdom, United States, and U. S. S. R. The United Kingdom acts as Secretariat for the committee. In addition, a number of other nations are kept informed of the work and progress of the committee by request. The resolutions passed at committee meetings are translated into various languages and furnished to all participating and interested member nations. Final approval of the resolutions passed at the Akron meeting was withheld by the French Delegation until it has had an opportunity to study the translations.

Delegates in Attendance

Delegates of seven nations were in attendance at the Akron meeting, at which Dr. W. J. S. Naunton, of Imperial Chemical Industries, Ltd., acted as chairman. Mr. Henry St. Leger, general secretary of the ISO, and Dr. H. M. Glass, assistant technical director of the British Standards Institution, the Secretariat for the committee, were also present. By permission of the official delegates observers from the American rubber industry sat in at each of the sessions. The official delegates were as follows, the leader of each delegation being mentioned first:

United States: S. Collier (Johns-Manville), G. H. Barnes (Goodyear), N. Bekkedahl (NBS), A. W. Carpenter (Goodrich), L. E. Cheyney (Minnesota Mining), L. V. Cooper (Firestone), S. R. Doner (Manhattan Rubber), B. S. Garvey, Jr. (Sharples Chemicals), E. G. Kimmich (Goodyear), H. M. Lawrence (ASA), G. C. Maassen (Vanderbilt), R. F. Tener (NBS), C. L. Warwick (ASTM).

United Kingdom: J. R. Scott (RABRM), C. M. Blow (BRPRA), J. M. Buist (ICI), L. Crompton (Dunlop Rubber), G. L. Hammond (Ministry of Supply), G. Martin (London Advisory Committee for Rubber Research), E. A. Murphy (Dunlop Rubber), R. G. Newton (BRPRA), E. F. Powell (Dunlop Rubber).

France: J. Duval (AFNOR), J. Bocquet (French Rubber Institute), J. LeBras (French Rubber Institute).

Netherlands: A. van Rossem (Rubber Institute), B. B. Boonstra, E. C. J. de Decker, and R. Houwink (all of the Rubber Foundation).

Italy: Stefano Oberto (Pirelli).

New Zealand: V. Armstrong (Observer from the New Zealand Scientific Liaison Office).

Switzerland: R. Herzog (Maison Datwyler).

A banquet was held under the auspices of ASTM Committee D-11 on Rubber at the Mayflower on Wednesday evening, October 18, with approximately 100 in attendance. Brief talks were given by the leaders of the various delegations attending the meeting and in addition Dr. Newton showed some interesting color movies he had taken during his recent 10-month stay in Malaya and Indonesia. The movies reflected the life and activities of the Far East other than rubber cultivation.

Some of Resolutions Offered

Discussions at meetings of ISO Technical Committee 45 on Rubber frequently hinge on documents prepared in advance, these documents having been prepared as a result of prior meetings and correspondence between meetings. Furthermore, the discussions were concerned with test methods, for example, which may ultimately be adopted as international standards. Some of the resolutions made at the Akron meeting require full knowledge of resolutions approved at previous meetings of ISO/TC/45, but many of them will be recognized for their intent by rubber technologists familiar with testing methods. It is on this basis that the following actions taken at the Akron meeting are offered:

Hardness Testing: It was resolved that the indenting ball should be 2.44 ± 0.06 mm. in diameter; that, subject to confirmation by the French delegation, the zero load should be 30 g. and that the total load should be 570 ± 5 g.; that the U.S.A. should undertake work on the effect of varied humidity on the hardness of synthetic and filled rubbers; that the ambient temperature for hardness tests should be 20 ± 2° C.; that the values obtained for hardness number in international work should be known as "International Hardness Degrees"; that the test piece should be maintained under the specified conditions for a period of at least 12 hours immediately prior to testing, and that the ambient temperature during conditioning should be the same as that during the test itself.

Tension Stress-Strain Testing: It was resolved that the internationally adopted tension stress-strain test piece should be that described as die III in Secretariat (Document) 60; that the distance between gage marks should not be more than one inch (25 mm.); that the ambient temperature during conditioning should be 20 ± 2° C., and that the test piece should be maintained under the same ambient conditions as those under which the test was carried out for a period of at least 12 hours immediately prior to the test.

Tear Strength Testing: It was resolved that the Crescent test method as described in Secretariat (Document) 41 should, at present, be adopted as the recommended type, and that all delegations should gain experience with the Angle and Delft test pieces during the next two or three years with a view to further consideration of these test pieces being given.

Ply Adhesion Testing: It was resolved that there should be no upper limit to the thickness of the test piece; that in the case of composite rubber-fabric articles incorporating cotton fabric, the humidity at which conditioning was carried out need not be specified; that the U.S.A. delegation would provide the Secretariat with information on the effect of humidity on rubber articles containing synthetic textiles for circulation; that the speed of jaw separation in the ply adhesion test should be a fixed speed in the range of 2 inches to 10 inches per minute, and that while it is considered desirable for the machine to have autographic load recording, it is not necessary for such a device to be fitted.

Also, that in the case of both strip and ring test pieces, the thickness of the ply or layer being separated should be not greater than the thickness of the remaining portion of the test piece, and should in no case be greater than ¼ inch or 6 mm.; that the conditioning period for test pieces containing cotton fabrics should be not less than 12 hours, and that delegations should submit to the Secretariat for circulation any data, published or otherwise, on the influence of temperature on ply adhesion strength for both vulcanized rubber products and those incorporating unvulcanized rubber (such as friction tapes).

Resolution on Aging

Aging: It was resolved that after curing, all test pieces should be stored in the dark until the commencement of the accelerated aging test; that the maximum temperature of storage before testing should not exceed 30° C.; that the maximum time of storage immediately prior to testing should not exceed 14 days; that care should be taken to ensure that the test pieces have a good, smooth finish and are free from blemishes and other flaws; that distinction should be made between different types of aging, which should be evaluated separately, and that in accelerated atmospheric cracking tests, exposure to ozone should be made in darkness so as to reduce skin formation and crazing.

Also, that in outdoor exposure tests the stretched rubbers should be shielded from light and a range of elongations be examined; that in accelerated atmospheric tests the concentration of ozone should be reduced until the exposure time for cracks to develop becomes two hours or more; that in development work compounds for evaluation by exposure to ozone or to air should contain at least a

small percentage of black to minimize the effects of incidental light; that test pieces for the determination of atmospheric or ozone cracking should be maintained under constant load; that atmospheric or ozone cracking should be judged by comparison with a series of graded photographs or standard samples, and that in sunlight or accelerated light tests the test piece should be unstressed.

Also, that when comparing different types of polymer for light resistance only, vulcanizates of the same color and transparency should be used; that in accelerated light tests an enclosed arc lamp with an intensity distribution as near as possible to that of sunlight should be employed; that the total intensity of radiation should be measured; that radiation of excessive intensity should be avoided so as to prevent overheating of the test pieces, and that if the source is water cooled, arrangements should be made for cleaning of the tubes to remove algae.

Abrasion Testing: It was resolved that the expression of results should be in terms of volume loss of test piece per 1000 revolutions of the abrasive disc; that the U.S.A. delegation should transmit its results using the extraction method to the Secretariat for circulation; that further experiments should be made on the use of rotating bristle brushes (for cleaning jets); that the zinc plate should no longer be considered as a standardizing material for the DuPont machine; that a specification for whiting should be adopted, and that paper base discs should be used as the abrasive medium in preference to bonded wheels.

French Grading Scheme Adopted

Grading of Raw Rubber: It was resolved that the technical grading scheme (as adopted by the French) should be applied to the usual market grades of natural rubber, that it should be added to the existing visual methods of grading, and that the criteria for technical grading should consist of a measurement of the rheological properties of the raw rubber and a measurement performed on a vulcanizate under conditions to be subsequently agreed; that a "lot" is an assemblage of bales in one consignment and all bearing the same technical grade marking; that a "sample" is the group of bales drawn from the lot for testing, and that the "piece" should be the portions of rubber cut from a bale in such a way as to represent the bale as accurately as possible.

Also, that random selection should be a method of selection in which no conscious choice is exercised; that if a bale cutter is available, cuts should be made through the bale transversely to the sheets or, alternatively, that one edge should be cut from the bale transversely through the sheets with a sharp knife to remove a portion of triangular section approximately 2x2x3 inches (5x5x7.5 cm.), but in either case the wrapping sheet should be removed and the weight remaining should be not less than 250 g.

Also, that the pieces from all the bales in the sample should be examined separately. If water has been used as a lubricant for the knife, the moisture should be wiped from the piece immediately. Each representative piece should be passed three times between the rolls of a laboratory mill with a nip set at 0.10-inch (2.5 mm.) and preferably at even speed; between successive passages the rubber should be rolled up and inserted endwise for the next passage. Test portions should be cut from the sheeted rubber for (a) viscosity determination, and (b) mixing and vulcanizing for testing the vulcanization properties.

Also, that (in determining Mooney viscosity) the dimensions, etc., and tolerances for die diameter, die height, rotor diameter, rotor thickness, etc., as specified in ASTM D927-49T should be adopted; that there should be serrations on the die cavity and rotor, but that their dimensions need not be specified, and that tests should be carried out in duplicate and the use of pliable film or the use of a suitable release medium (e.g., silicon fluid) should be permitted.

Also, that (in determining vulcanization properties) platen presses capable of exerting a minimum of 400 psi and calibrated to within ± 0.5° C. should be adopted; that molds should have cover plates ½-inch thick and the distance between the edge of the rubber and the edge of the platen should be not less than 3 inches; that mixing should be carried out using either masterbatches containing not more than 5% of the rubber of the mix or a blend of the powders so that the number of weighings is reduced; that, for the present, the procedure as defined in Document (France) 3 should be adopted with the exception that the temperature should be 70° C. ± 3°C. instead of 60° C. ± 3° C.

Also, that pending further information the ACS 1 mix should be used; that, for the time being, strain at low stress and stress at high strain should be used as alternatives, correlation tables being available; that one time of cure, namely 40 minutes, should be adopted, and that inter-laboratory variations (and other errors) associated with test methods should be quoted wherever possible.

Latex: It was resolved (for mechanical stability testing) that the speed of stirring should be 14000 ± 200 rpm and that the temperature of the test should be 35 ± 1° C.; that delegations should undertake investigations with latices of 55% and 58% solids content (the liquid used for dilution should be a 0.6% ammonia solution); that an interval of not greater than six hours should elapse between the dilution of the sample and the time of test; that the size of the sample should be 80 g. Incidentally, it was agreed that viscosity of latex was not worth pursuing as an item on future programs because, at least at the present stage, it is not a property, an exact knowledge of which is of value to the user.

Resolution on Flex-Cracking

Flex-Cracking: It was resolved that the definitions relating to flex cracking as given in Secretariat (Document) 52 should be adopted, i.e., "crack initiation" and "crack growth"; that the method of logarithmic spacings described in Clause 26.25 of B.S. 903: 1950 should be investigated by each delegation in order that this subject be further discussed at the next meeting; that delegations should collect what information they have on the effects of temperature and speed of test on flex cracking, with a view to discussion at a later meeting, and that the survey contained in Secretariat (Document) 52 should be accepted as a suitable basis for further discussion and work on flex cracking.

Also, that the U.S.A. delegation should provide the results of its work on flex cracking to the other members of ISO/TC/45 when they were complete; that the U.S.A. delegation would supply, when ready, full details of their recommended tool (for determining crack growth), and that the other delegations would then carry out investigations on the method of inserting the crack; that no close tolerances on temperature could be agreed at present, but that this would be reviewed when full data became available, and that an informal working group should be formed, with the Netherlands, U.K. and U.S.A. as the member bodies, to study the A.S.T.M. and B.S.I. specifications for the DeMattia Machine, with a view to eliminating what differences existed between these specifications.

The aforegoing reviews some of the action taken at sessions held from Monday, October 16, through Thursday, October 19. A report on resolutions adopted at the sessions on Friday, October 20, including those on Rubber-to-Metal Bonding, Dynamic Tests, and Classification of Vulcanized Rubber by Physical Properties, will appear in an early issue.

Small Business Survey

Approximately 70 per cent of the more than 2000 companies supplying the B. F. Goodrich Company with goods and services during 1949 are so-called "small" businesses, according to a survey recently completed by the company. Determining the suppliers that were classified as "small", B. F. Goodrich used for measurement annual sales of less than $5,000,000, or those companies having fewer than 500 employees. The survey showed that some suppliers are merchants with few employees but with relatively large annual sales volumes. More than 70 per cent of the company's suppliers in 1949 were manufacturers. In addition to suppliers, 46,000 dealers, retailers and distributors of tires, auto accessories, industrial rubber products, footwear, soles and heels, surgical, druggist and household supplies, plastics, chemicals and aeronautical products, all "small" by accepted standards, are associated with Goodrich, making up an integrated business in which each segment is dependent in varying degrees upon the performance and progress of the others.

FINANCIAL NEWS

Boston Woven Hose & Rubber Co.

Year Ended August 31: Net income of $713,740, which is equal to $7.84 a common share, compared with $510,515, or $5.46 a common share, in the previous year. Net sales for the year ended August 31, 1950, amounted to $13,597,025, against $13,143,719 for the 1949 fiscal year. Total current assets on August 31, 1950, amounted to $6,704,153, against $5,838,815 the year before. Total current liabilities at the end of the 1950 fiscal period amounted to $1,540,318, while at the end of the previous fiscal year total current liabilities amounted to $1,061,060.

American Zinc-Lead-Smelting

First Nine Months: Net profit of $2,669,621, which is equal to $3.59 a common share, compared with $788,230, or 79c a share, last year. Figures for the September quarter indicate a net profit of $1,423,382, which is equal to $1.99 a common share, contrasted with a net loss of $163,437 in the September quarter of 1949.

Eagle-Picher Co.

Nine Months Ended Aug. 31: Net earnings of $1,891,866, which is equal to $2.12 a share, compared with a net credit to earned surplus (after giving effect to the transfer of $4,500,000 from the reserve for decline in inventory value) of $2,631,476, or $2.96 a share, for the first nine months of the preceding year.

Interchemical Corporation

First Nine Months: Net profit of $3,394,323, which is equal to $4.73 a common share, compared with $1,307,069, or $1.57 a common share, for the corresponding period of 1949. Sales in the first nine months of 1950 amounted to $61,583,921, against $51,154,979 in the first nine months of 1949.

Allen Industries, Inc.

First Nine Months: Net profit of $1,204,906, which is equal to $2.15 each on 559,200 capital shares, contrasted with $847,072, or $1.51 a share each on an equal number of shares in the first nine months of 1949.

St. Joseph Lead Co.

First Nine Months: Net income of $7,757,769, which is equal to $3.93 a share on net sales of $72,398,505, compared with $7,085,639, or $3.59 a share on sales of $65,660,275, in the first nine months of 1949.

Crown Cork & Seal Co.

First Nine Months: Net income of $1,581,460, which is equal to 97c a common share, compared with $1,862,802, or $1.20 a share in the first nine months of 1949.

Electric Auto-Lite Co.

First Nine Months: Net profit of $9,984,391, which is equal to $6.68 each on 1,494,855 capital shares, compared with $7,330,652, or $4.90 each on an equal number of shares, in the first nine months of 1949. Net sales for the period ended September 30, 1950, amounted to $170,597,077, against $167,975,049 in the first nine months of the preceding year. For the six months ended June 30, 1950, the company reported a net profit of $5,187,591, which is equal to $3.47 a share, contrasted with $3,593,707, or $2.40 a share, in the like period of the preceding year.

National Automotive Fibres, Inc.

First Nine Months: Net profit of $3,350,562, which is equal to $3.36 each on 996,145 capital shares, compared with $3,680,999, or $3.69 each on 996,152 capital shares for the nine-month period ended September 30, 1949. In the first nine months of 1950, net sales totaled $52,203,588, against $50,382,516 in the first nine months of 1949.

Monsanto Chemical Co.

First Nine Months: Net income of $20,762,781, which is equal to $4.48 a common share, compared with $11,555,833, or $2.48 a common share, in the first nine months of the preceding year. Consolidated sales for the nine months ended September 30, 1950, totaled $163,271,934, against $121,372,141 for the nine months ended September 30, 1949.

Rome Cable Corp.

Third Quarter: Net profit of $379,542, which is equal to 90c a common share, compared with an operating profit of $73,076, or 15c a share last year. For the six months ended June 30, 1950, the company reported a net profit of $639,798, which is equal to $1.50 a common share, against an operating profit of $86,606, or 14c a share, for the first six months of 1949.

DeVilbiss Company

First Nine Months: Net profit of $649,925, which is equal to $2.17 a share, compared with $359,200, or $1.20 a share, for the first nine months of 1949. For the quarter ended September 30, 1950, the company reported a net profit of $382,814, which is equal to $1.28 a share, against $84,517, or 28c a share, for the third quarter of the preceding year.

Brunswick-Balke-Collender Co.

First Nine Months: Net profit of $1,853,294, which is equal to $3.90 a common share, compared with $1,323,587, or $2.73 a share last year.

New Armour Rubber Laboratory

A new $10,000 rubber research laboratory has been established at the Armour Research Foundation of the Illinois Institute of Technology in Chicago, Ill. Specific projects now in progress include custom compounding of rubber stocks for specialized uses and a basic study of new types of petroleum oils and resins in the compounding of rubbers. A 200-ton hydraulic press, a rubber mill, and other pieces of heavy equipment were donated jointly by the Foundation and the White Cap Co. of Chicago. Various pieces of testing equipment were donated by the Precision Scientific Co., also of Chicago. Dr. Alfred G. Susie, supervisor of rubber and plastics research at the Foundation, said that a staff of rubber specialists will work with both natural and synthetic rubbers. "The retraction or 'snap back' quality of uncured rubber is very limited," Dr. Susie explained. "By proper compounding, we can not only improve the retraction quali- ... but also build in a resistance to heat build-up, abrasion, ozone, stain and solvents."

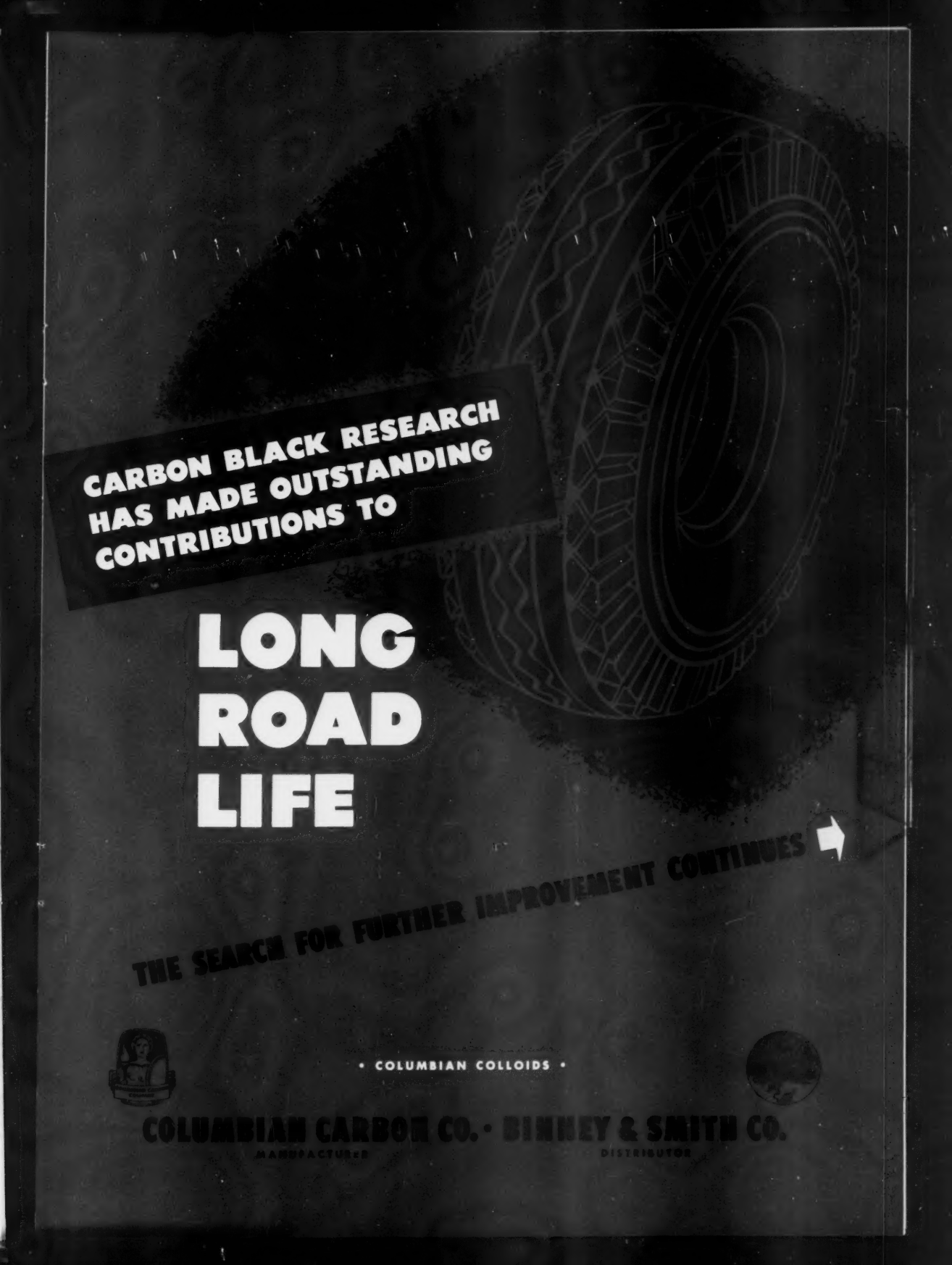
Ideal Vinylite-Skinned Doll

Ideal Novelty & Toy Co., New York, N. Y., is producing a new doll which combines the versatile talents of kissing, changing expressions, pouting, puckering and opening its mouth. Molded in the likeness of a three-week old baby, the doll's skin is made of Vinylite resin, product of the Bakelite Division of the Union Carbide & Carbon Corp. Pressing a hidden mechanism in the doll's back serves to make it frown, move its tongue and suck its thumb. Another mechanism in the doll's soft, cotton stuffed body simulates the sound of heartbeat. Special vinylite resins used for the head and limbs are highly resistant to abrasion, discoloring, moisture, mildew, food acids, and can be wiped clean with a damp cloth. Clothed just like a real baby of three-weeks, the doll is also provided with pink, beribboned baby blankets. The doll, called the "Blessed Event," is available in four sizes from 18 to 21-inches in length.

Making Flexible Plastic Pipe

The Carlon Products Corporation, formerly known as the Carter Products Corp., has acquired a plant in Corsicana, Texas, for the manufacture of flexible plastic pipe. The basic material used in the Carlon pipe is polyethylene. The pipe is manufactured by means of a special extrusion process and according to company officials sections up to 400 feet in length have been installed in one piece. Advantages claimed for the flexible plastic pipe include high strength and durability and resistance to breaking, denting or splitting. A 100-foot section of the pipe weighs less than 45 pounds.

B. F. Goodrich has leased a 176,500 square foot building in Chicago, Ill., which it plans to use next spring for its warehousing and office operations in the Chicago and parts of the Omaha, St. Louis and Cincinnati districts.


CARBON BLACK RESEARCH
HAS MADE OUTSTANDING
CONTRIBUTIONS TO
LONG
ROAD
LIFE
THE SEARCH FOR FURTHER IMPROVEMENT CONTINUES
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3-Way Program

Our three-pronged research program suggests further improvement in tire performance. Continuing investigations look toward:

1. **Improvement in the chemical and physical properties of rubber carbons.**
2. **Improvement in the formulation of tire compounds.**
3. **Improvement in processing techniques.**

Beyond these specific projects our technical staff is always available for consultation and for cooperative investigation in any project involving the use of carbon blacks in rubber.

COLUMBIAN CARBON CO. MANUFACTURER

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NEW POLYMERS AUTHORIZED BY OFFICE OF RUBBER RESERVE, RECONSTRUCTION FINANCE CORPORATION

Listed below are types and properties of new experimental GR-S polymers (including GR-S latices) which have been authorized by the Office of Rubber Reserve, Reconstruction Finance Corporation, since publication of those in our previous issue. Procedures for the distribution and sale of these polymers will be found in our October, 1945, issue. Normally, experimental polymers will be produced only at the request of the consumers and 20 bales (one bale weighs approximately 75 pounds) of the original run will be set aside if possible for distribution to other interested companies for their evaluation. The 20 bales when available will be distributed in quantities of one or two bales upon request to the Sales Division of Rubber Reserve or will be held for six months after the experimental polymer was produced unless otherwise consigned before that time. Subsequent production runs will be made if sufficient requests are received to warrant them.

X Number	*Manufacturing Plant*	*Date of Authorization*	*Polymer Description*
X-595 GR-S	U. S. Rubber, Borger	9-1-50	A mixture of 55 parts Philblack O and 100 parts of a GR-S polymerized at 41° F. Marasperse plus NaOH used in carbon black slurry make-up. Butadiene/styrene charge ratio 75/25 adjusted to give 20 ± 1% bound styrene on the polymer, activated with cumene hydroperoxide. Emulsified with Nilox potassium soap; shortstopped with hydroquinone. Shortstop latex viscosity 50 ML-4 @ 212° F.; stabilized with 1.5% BLE.
X-596 GR-S	General, Baytown	8-17-50	A mixture of 50 ± 2 parts Philblack A and 100 parts of a GR-S polymerized at 41° F.; sodium lignin sulfonate and lignin used in carbon black slurry make-up. Butadiene/styrene charge ratio 71.5/28.5; activated with cumene hydroperoxide or diisopropylbenzene hydroperoxide, or mixture of both. Emulsified with Dresinate 214 and K-ORR soap; shortstopped with DNCB. Shortstop Mooney viscosity 36 ± 5 ML-4 @ 212° F.; stabilized with 1.5% PBNA.
X-597 GR-S	General, Baytown	8-14-50	A mixture of 50 ± 2 parts Philblack O and 100 parts of a GR-S polymerized at 41° F.; sodium lignin sulfonate, Dresinate 214 and lignin used in carbon black slurry make-up. Butadiene/styrene charge ratio 71/29; activated with diisopropylbenzene hydroperoxide. Emulsified with Dresinate 214 and K-ORR soap; shortstopped with DNCB. Shortstop Mooney viscosity 37 ± 5 ML-4 at 212° F. Stabilized with 1.5% PBNA.
X-598 GR-S	General, Baytown	8-14-50	A mixture of 50 ± 2 parts Philblack O and 100 parts of a GR-S polymerized at 41° F.; sodium lignin sulfonate, Dresinate 214 and lignin used in carbon black slurry make-up. Butadiene/styrene charge ratio 71.5/28.5; activated with cumene hydroperoxide or diisopropylbenzene hydroperoxide, or mixture of both. Emulsified with Dresinate 214 and K-ORR soap; shortstopped with DNCB. Shortstop Mooney viscosity 36 ± 5 ML-4 at 212° F. Stabilized with 1.5% PBNA.
X-599 GR-S	Goodyear, Houston	8-16-50	Butadiene/styrene charge ratio 71/29 polymerized at 41° F.; activated with cumene hydroperoxide, or diisopropylbenzene hydroperoxide, or mixture of both. Emulsified with Dresinate 214; shortstopped with DNCB. Mooney viscosity 52 ± 6 ML-4 @ 212° F.; stabilized with 1.25% PBNA.
X-600 GR-S	Copolymer, Baton Rouge	8-16-50	Same as X-478 GR-S except butadiene/styrene charge ratio 90/10, activated with cumene hydroperoxide or diisopropylbenzene monohydroperoxide, or mixture of both. Mooney viscosity 38 ± 5 ML-4 @ 212° F.
X-601 GR-S-SP	U. S. Rubber, Naugatuck	9-1-50	Butadiene/styrene charge ratio 90/10 polymerized at 41° F.; activated with cumene hydroperoxide. Emulsified with K-ORR soap; shortstopped with sodium dimethyl dithiocarbamate. Mooney viscosity 55 ± 7 ML-4 @ 212° F.; stabilized with 1.25% BLE. Glue-acid coagulation.
		Please note Change in Experimental Polymer Listed Below	
X-478 GR-S	Copolymer, Baton Rouge	7-26-50	Mooney viscosity changed to read 52 ± 6 ML-4 @ 212° F.

NOTE: The above new polymers are experimental only and the Office of Rubber Reserve, Reconstruction Finance Corporation, does not make any representations or warranties of any kind, expressed or implied, as to the specifications or properties of such experimental polymers, or the results to be obtained from their use.

Dayton Firm Changes Name

Plastic and Rubber Products, Inc., 3110 Oakridge Drive, Dayton 7, Ohio, has changed its name to Precision Rubber Products Corp., and will continue business at the same address. There has not been any change in company personnel or products. The firm manufactures mechanical goods, principally packings. Harold G. Taylor is president and general manager of the company, while Robert E. Allen is vice-president and sales manager.

Planning New Dunlop Factory

Dunlop Rubber (Australia), Ltd., is reported to be planning the construction of a new rubber factory in the vicinity of Melbourne. The new plant, expected to cost approximately $560,000, is included in the company's plans for the large scale production of aircraft parts for both defense and civilian needs. Some of the parts would be used for jet aircraft, the production of which is expected to start shortly in Australia.

Canadian Plant for General Tire

General Tire & Rubber Co., Ltd., Canadian subsidiary of the Akron, Ohio, firm of the same name, has announced plans for the construction of a $5,000,000 plant in the Toronto area near Sarnia, Ont., Canada. Plans call for constructing a new warehouse and office building as well as a manufacturing plant on a 26-acre tract now owned by the firm. The plant will employ about 1,500 persons in the production of mechanical rubber goods.

NAMES IN THE NEWS

PHILIP BARNES, associated with the Weston Electrical Instrument Corp., Newark, N. J., for the past 16 years, has been named general sales manager of the company.

DR. FRANKLIN T. PETERS, formerly associated with the Sales Department of the Glyco Products Co., has been appointed manager of the newly-established Market Development Department of the Heyden Chemical Corp. DR. ARTHUR L. DAVIS, previously associated with Heyden's Technical Sales Department, will be in charge of New Products Applications in the Market Development Department.

STUART J. CANTER, formerly of the Polytechnic Institute of Brooklyn, has joined the Chemicals Procurement Co., New York 18, N. Y., sales agents for specialty and intermediate chemicals.

GEORGE L. DIRKS, formerly general superintendent of the Metal Products Manufacturing Division of the B. F. Goodrich Co., has been named general manager of the Canadian Division of Yale & Towne Manufacturing Co., in St. Catherines, Ont., Canada.

GEORGE C. JOHNSON, who recently resigned as general sales manager of the Quaker Rubber Corp., Philadelphia, Penna., has been named promotional sales manager for the Hamilton Rubber Manufacturing Corp., Trenton, N. J.

CARLETON ELLIS, JR., has been named manager of the newly-created Coating Resins Department of Plaskon Division of Libbey-Owens-Ford Glass Co., Toledo, Ohio.

TED M. MYERS has been named general sales manager of Youngs Rubber Corp., New York, N. Y.

HAROLD T. MARSHALL, director of sales for the Kendall Co., Walpole, Mass., has been elected a vice-president of the company.

CHESTER M. BROWN, associated with the General Chemical Division of the Allied Chemical and Dye Corp., New York 6, N. Y., for the past 21 years, has been appointed a vice-president of the company.

CARL S. MENGER, formerly sales manager of the Triangle Conduit and Cable Co., New Brunswick, N. J., has been named vice-president in charge of sales for the company. THOMAS M. QUINN, formerly purchasing agent for the company, has been named vice-president in charge of purchasing.

GLEN B. MILLER, controller of the Allied Chemical and Dye Corp., New York 6, N. Y., has been appointed a vice-president of the company.

J. E. TRAINER, vice-president in charge of production and a director of the Firestone Tire & Rubber Co., has been elected vice-president for industry of the National Safety Council.

ARTHUR SUKKAMP, vice-president and chairman of the Finance Committee of the U. S. Rubber Co., has been re-elected vice-president of the Controllers Institute of America.

L. V. HENDERSON has been appointed southern states representative for the Irvington Varnish & Insulator Co. of Irvington, N. J., with headquarters in Atlanta, Ga.

F. S. SWACKHAMER, formerly assistant manager of the Eastern Division Sales Development Department of the Shell Chemical Corp., has been named manager of the department succeeding W. S. THORNHILL, who recently resigned to form U. S. Polymeric Chemicals, Inc., at Stamford, Conn.

JAMES L. HAYES, until recently president of the Inland Rubber Corp., Chicago, Ill., has been elected a vice-president of the National Advertising Co., a subsidiary of the Minnesota Mining and Manufacturing Co. at Waukesha, Wisc.

WILLIAM A. BLUME, previously president of the American Brakeblok Division of the American Brake Shoe Co., and vice-president of the parent company, has been appointed administrative vice-president of the Asbestos Manufacturing Co., Huntington, Ind.

ROBERT K. SPOFFORD, formerly purchasing agent for the Okonite Co., Passaic, N. J., has been appointed director of purchasing for John A. Roebling's Sons Co., Trenton 2, N. J.

R. K. MUELLER, formerly production manager of the Plastics Division of the Monsanto Chemical Co. at Springfield, Mass., has been named assistant general manager of the division. JOHN C. GARRELS, JR., previously plant manager, has succeeded Mr. Mueller as production manager. R. M. MORRIS, formerly phenolics plant manager at Springfield, has been appointed plant manager succeeding Mr. Garrels.

JOHN L. COLLYER, chairman of the board and president of the B. F. Goodrich Co., Akron, Ohio, has been appointed chairman of the Payroll Savings Bond Advisory Committee for Ohio by the Savings Bond Division of the U. S. Treasury.

W. R. "DICK" HUCKS, formerly associated with the Waco, Texas, plant of the General Tire & Rubber Co., and more recently connected with the R. H. Schwartz Rubber Co. at Cleveland, Ohio, has joined Otto Items, Inc., at St. Louis, Mo.

R. G. BELLEZZA, formerly president of Locke, Inc., Baltimore, Md., an affiliate of the General Electric Co., has been appointed vice-president in charge of sales of the General Cable Corp., New York, N. Y.

JOSEPH F. BATES, president of the Bates Chemical Co., Lansdowne, Penna., has been appointed director of the Chemical Division of the National Production Authority.

WILLIAM A. BLUME, previously president of the American Brakeblok Division of the American Brake Shoe Co., and a vice-president of the parent company, has been elected a vice-president of the Thermoid Co., Trenton, N. J., in charge of original equipment business for the automotive industry in Detroit.

ROBERT A. HOFFER, formerly associated with E. I. du Pont de Nemours & Co., Inc., has been named engineering manager of the Plastics Division of the Chemical Department of the General Electric Co., Pittsfield, Mass.

R. H. MCPEAKE, formerly partner of an industrial engineering and importing firm in Buenos Aires, Argentina, representing American manufacturers, has been appointed sales manager of the Aldrich Pump Co., Allentown, Penna.

DR. WILLIAM C. DEARING, formerly director of research for the Behr-Manning Corp., Troy, N. Y., has joined Koppers Co., Inc., Pittsburgh 19, Penna., as assistant manager of the Research Department Laboratory Section.

GEORGE W. PARKIN, previously division manager at Trenton, N. J., for National Automotive Fibres, Inc., has been named assistant sales manager of the Automotive Division of the company with headquarters in Detroit, Mich.

DR. GILBERT THIESSEN, formerly technical advisor for the Chemical Division of the Koppers Co., Inc., Pittsburgh 19, Penna., has been named manager of the Laboratory Section of the Central Research Department of the company.

JOHN H. PALMER, associated with the Firestone Tire & Rubber Co., Akron, Ohio, since 1934, has been named manufacturers sales manager in the Detroit, Mich., area, for the Firestone Industrial Products Co.

HERBERT E. SMITH, chairman of the board of the U. S. Rubber Co., New York 20, N. Y., has been named chairman of the group soliciting funds from the rubber industry for the 72nd annual appeal of the United Hospital Fund Campaign.

JAMES M. LANCASTER, formerly personnel director of the National Synthetic Rubber Corp., during World War II, and more recently associated with the Morristown, Penna., Division of the Mid-States Gummed Paper Co., has been appointed personnel director of the Kentucky Synthetic Rubber Corp., Louisville 1, Ky.

AUGUST RUBBER CONSUMPTION SETS A 113,421 TON RECORD

Setting a new mark for the third time in the last four months, United States manufacturers consumed 113,421 long tons of new rubber in August, according to preliminary statistics, the U. S. Department of Commerce reported recently. Consumption was 105,089 tons in July, and in June the previous high of 111,941 tons was reached. For the first eight months of this year, new rubber consumption totaled 817,555 tons, up 23.9 percent from the 659,998 tons reported in January-August, 1949, and up 11.0 percent from the previous high mark of 736,270 tons reported in January-August, 1947.

Fewer tires were produced in August than in July; evidently the increase in rubber consumption was in the non-transport segment of the industry. Other indications of high non-transport activity in August were the high consumption figures for natural latex and neoprene, which, at 4,913 tons and 3,926 tons, respectively, were 27 percent and 29 percent greater than the July figures. The non-transport segment regularly accounts for more than 90 percent of the total consumption of each of these rubbers.

The natural latex figure erased the old mark of 4,440 tons set in May, but stocks declined 426 tons to 4,216 tons at the end of August, less than a month's supply at the August rate of consumption.

Natural Rubber Consumption

Consumption of natural rubber including latex reached the postwar high of 63,852 tons in August, up 2,450 tons from July. Use of U. S. Government GR-S was placed at 35,665 tons, up 4,151 tons from July, and the highest figure since October, 1947. The ratio of Government GR-S consumption to total natural plus Government GR-S rose to 35.8 percent from 33.9 percent in July, and was the highest since June, 1949.

Consumption of other S-type rubber was calculated at 2,654 tons in August, and consumption of N-type at 1,323 tons. The neoprene figure given above was the highest since January, 1947. Total butyl consumption was 6,001 tons. Use of reclaim increased 3,430 tons to 25,807 tons in August, and the ratio of reclaim consumption to total new rubber consumption, after a dip to 21.3 percent in July, rose to 22.8 percent in August, the highest ratio in 10 months.

Imports of natural rubber totaled 72,248 tons in August, and 522,606 tons in the first eight months of this year. Latex included in these totals amounted to 5,253 tons and 32,309 tons, respectively. The August latex figure was second only to the 6,476 tons posted in December, 1941. With four months to go, 1950 imports of latex will break the 1941 record of 34,798 tons, and total natural rubber imports should exceed by a considerable margin the postwar high of 735,340 tons recorded in 1948.

Production of synthetic rubber inched upwards 851 tons to 44,671 tons in August, the highest output since April, 1947. The total included 33,587 tons of Government GR-S, 761 tons of other S-type, 4,901 tons of butyl, 4,246 tons of neoprene, and 1,176 tons of N-type. In January-August, 1950, output totaled 289,348 tons, up 3.7 percent from the 278,944 tons produced in January-August, 1949.

August reclaim production was 27,548 tons, 3,174 tons greater than in July. The January-August, 1950, total was 188,258 tons, an increase of 29.0 percent over the 145,937 tons reported in the corresponding 1949 period. Stocks of dry natural rubber available to industry declined 6,092 tons to 82,919 tons at the end of August, a meager 1.4 months' supply at the August rate of consumption. Total synthetic stocks, falling 3,002 tons, amounted to 62,083 tons, only 1.3 months' supply. Reclaim stocks increased 921 tons to 31,292 tons, but represented only 1.2 months' supply.

APS Plans November Meeting

The Division of High-Polymer Physics of the American Physical Society will hold its Eighth Meeting in Chicago, Illinois, on November 24 and 25, with sessions being held at the University of Chicago and the Museum of Science and Industry. A feature of the meeting is a symposium on Solidification and Crystallization in Polymers, which is being presented in conjunction with a related symposium of the A.P.S. Division of Solid-State Physics, which is also meeting in Chicago. Fourteen other papers are on the division program.

"Guide for the Prospective Importer," a new 25-page booklet published by the Economic Cooperation Administration outlining important "do's" and "don't's" for actual and potential importers of goods from Marshall Plan countries, is now available from the Office of Information, ECA, 800 Connecticut Ave., Washington 25, D. C.

Personnel Shifts at Goodrich

Earl Hensal, formerly superintendent of tire production at the Canadian plant of the B. F. Goodrich Co., at Kitchener, Ont., has been named production superintendent of tire manufacture at the Akron, Ohio, plant of the company. Mokal G. Morgan, previously production superintendent of the Miami, Okla., plant of the company, has been named superintendent of tire production at Kitchener, succeeding Mr. Hensal. Mr. Morgan's post at Miami has been assigned to William L. Carpenter who was formerly assistant to the general manager of the Tire Division at Akron. Mr. Hensal, a graduate of the University of Akron, has been associated with Goodrich since 1933. Mr. Morgan, a graduate in chemistry from Virginia Polytechnic Institute, has been with the company for the past 12 years. Mr. Carpenter joined the company 15 years ago, after receiving his bachelor's and master's degrees in chemistry from Northwestern University.

Replacement Tires Raised Again

For the fifth time this year, major tire producers have raised the prices of tires destined for the replacement market by 7½ to 10%. The move was initiated on October 25 by the Goodyear Tire & Rubber Co., which increased the prices of all passenger tires, except white sidewalls, by 7½%. White sidewalls were raised 10%. All truck and bus and farm tires were raised 7½% as were all natural rubber tubes. Puncture seal tubes or tubes made of butyl were not raised. Prices of solid or pneumatic industrial tires and tubes, bicycle and motorcycle tires and tubes were not advanced. In all cases, producers cited the rising costs of raw materials as the determining factor in the price increases.

ROTEX RUBBER MOVES INTO NEW, MODERN PLANT IN NEWARK, N. J.

The Rotex Rubber Co., Inc., which has been engaged in the rubber and plastic scrap field for many years, and which was formerly located at 437 Riverside Avenue in Newark, N. J., has moved into a new, modern, one-story building at 1-23 Jabez Street, Newark 5, N. J. The new telephone number is HUmboldt 2-8000. The move represents an expansion and consolidation of the company's previous locations at North Newark and Belleville, N. J., and the new facilities are better designed and adapted for the efficient handling of scrap. Additional processing equipment is currently being installed and will soon be in operation. Rotex Rubber, which is headed by Jacob Hirschberger and Eric F. Ross, is active in both the domestic and export fields.

Named Okonite Purchasing Agent

Kenneth T. Gordon

Kenneth T. Gordon, a member of the sales staff of the Okonite Co., Passaic, N. J., since 1948, has been appointed purchasing agent of the company. He will also direct purchases for the company's Hazard Insulated Wire Works Division at Wilkes-Barre, Penna., and for the Okonite-Callender Cable Co. of Paterson, N. J. At the same time, the company announced that John L. Fabiny, previously in charge of metals and chemicals purchases, has been named assistant purchasing agent. Mr. Fabiny has been with the company for the past 25 years, most of the time with the Hazard Division. Mr. Gordon was born in England in 1916 and started his business career in the sales department of Howard Ford & Co., Ltd., of Liverpool. For seven years during the entire World War II period he served in the British Army and held a commission as Major. In 1946 he entered the overseas sales department of British Insulated Callender's Cables, Ltd., and then, in 1948, came to the United States to join the sales organization of the Okonite Co.

Parker Licenses Producing Firm

Synthetic Rubber Products Co. of Los Angeles, Cal., has been licensed to mold seals, gaskets, diaphragms and other parts from approved synthetic rubber compounds specifically developed by the Parker Appliance Co., Cleveland, Ohio, for aircraft hydraulic and aviation fuel systems. The company will also distribute the complete line of Parker O-rings, including seals for hydraulic service, gaskets, seals for fuel resistant service, and fuel resistant and oil resistant seals for aircraft engine applications.

RMA Moves Washington Office

On October 2, the Rubber Manufacturers Association, Inc., moved its offices in Washington, D. C., to Suite 210 of the Marsh Building, 1832 M Street, N.W., Washington 6. The telephone number is Sterling 6177.

Goodrich Proposes Stock Split

Directors of the B. F. Goodrich Co., at a special meeting in New York City on October 25, voted to recommend to stockholders that the common stock of the company be split three-for-one, and that the authorized common be increased by the number of additional shares resulting from the proposed split. Stockholders of record as of November 27 will be entitled to vote at the special meeting called for January 13 to consider the proposal. Holders of both preferred and common stock are entitled to vote on the amendment, a two-thirds vote, without regard to class, being required for approval. The proposed change will not result in any change in the capital or surplus accounts, but it is expected to increase the marketability of the stock. The company is also calling 100,000 shares of its preferred stock for redemption on December 15 at $101.00 a share, plus accrued dividends. The shares to be redeemed will be selected by lot on November 10 and will not be transferable on the books of the company thereafter.

NPA Forms Small Business Unit

The National Production Authority has created an Office of Small Business to insure maximum participation of smaller business concerns in the defense effort. Edward H. Lane has been named as special assistant to the administrator for small business. Mr. Lane will report directly to William H. Harrison, NPA Administrator, on problems relating to small business and will supervise the new office. NPA officials pointed out that while the Office of Small Business will have no direct power to award contracts or to assist in the financing of defense production, it can assist small business in obtaining defense contracts and in keeping abreast of increasing defense needs.

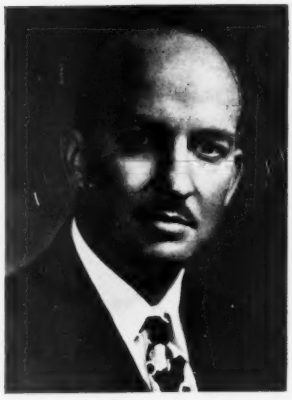
Klingfast Rubber Co. Fined

Klingfast Rubber Co. of Akron, Ohio, and its operator, Clyde W. Martin, were fined on October 10 in Federal District Court in Cleveland, Ohio, for having manufactured defective prophylactics. Mr. Martin has been employed as chauffeur to inventor John R. Gammeter for the past 18 years, and operated Klingfast Rubber in the garage of the Gammeter residence in Akron. The company itself was fined $250 on each of four charges, while Mr. Martin was fined $50 each on four charges made by the Federal Food and Drug Administration. The Government agency contended, among other things, that the prophylactics produced by Klingfast Rubber were too porous.

G-E Opens Washington Office

A new sales office for the Chemical Department of the General Electric Co. has been opened in Washington, D. C. The office is located in the Shoreham Building at 806 Fifteenth St., N.W. With increasing defense activities, the Chemical Department has established this office in the Capitol area to efficiently serve governmental requirements.

Named Acting Research Director



Dr. Franklin Strain

Dr. Franklin Strain, associated with the Columbia Chemical Division of the Pittsburgh Plate Glass Co., Pittsburgh 22, Penna., since 1937, has been named acting director of research in charge of the Columbia Chemical Division laboratories at Barberton, Ohio. In his new position, Dr. Strain succeeds Dr. Alphonse Pechukas who recently resigned. Dr. Strain had served as assistant director of research for the laboratories for the past eight years. Previously, he had been associated with the Barberton laboratories as a research chemist. A native of Peyton, Colo., Dr. Strain was educated at Ottawa University and at the University of Kansas where he earned the degrees of master of science and Ph. D. in organic chemistry. He is a member of the American Chemical Society, the Association for the Advancement of Science, the Society of the Chemical Industry, and Alpha Chi Sigma.

Woods Named Thermatomic Chairman

J. Albert Woods has been elected chairman of the board of the Thermatomic Carbon Co., succeeding Major T. P. Walker, who recently retired. Maynard C. Wheeler, a director of the company, has been elected president, while Howard L. Sanders, also a director, was named a vice-president. Clark C. Boardman continues as resident manager of the company's plant at Sterlington, La. Mr. Woods is president of the Commercial Solvents Corp. of New York, of which Thermatomic Carbon is an affiliate. Mr. Wheeler and Mr. Sanders are both vice-presidents of Commercial Solvents.

Grand Prairie Rubber Expanding

Grand Prairie Rubber Co., Grand Prairie, Texas, has started construction of new facilities at a site east of Arlington, Tex. Officials of the company have declined to state which part of the company's operations would be moved to the new location. Grand Prairie manufactures rubber oil field equipment parts and tires for lawnmowers and toys.

SYMPOSIUM ON GASKETS PLANNED BY ASME RUBBER-PLASTICS GROUP

A Symposium on Gaskets and Packings will be a feature of the annual meeting of the Rubber and Plastics Division of the American Society of Mechanical Engineers, to be held at the Hotel Statler in New York City on November 30-December 1 in conjunction with the 71st Annual Meeting of the parent society. The symposium will be given on the afternoon of November 30 in a joint session with the Machine Design Division of the society.

In all, the divisional meeting will feature the presentation of nine papers, three of them in the symposium. The opening session on the morning of November 30 will see the presentation of talks on "Advances in Revolving Shaft Seals," by E. F. Riesing and H. H. Klein, of the National Motor Bearing Co., Detroit, Mich., and "Pressures Developed by Viscous Materials in the Screw Extrusion Machine," by William T. Pigott, of the Goodyear Tire & Rubber Co. A report on "Advances in the Uses of Rubber in Engineering for 1949-50" will be given by Miss L. E. Straka, of the Goodyear Tire & Rubber Co., Akron, at this same session.

The symposium on the afternoon of November 30 will feature the three following papers: "Sealing with Rubber—Relation of Design to Properties of Elastomers," by J. W. Swartz, Linear, Inc., Philadelphia, Penna.; "Studies of Relaxation Characteristics of Non-Metallic Gasket Materials," by R. G. Farnham, F. D. Farnham Co., Chicago, Ill., and "Rubber and Plastics in Packing," by F. C. Thorn, Garlock Packing Co., Palmyra, N. Y.

The morning of December 1 will be a plastics session, with the two following papers scheduled: "Strength Behavior of Adhesive Bonds," by H. P. Meissner and Gunther H. Baldauf, Massachusetts Institute of Technology, Cambridge, Mass., and "Creep Properties of Lucite and Plexiglas for Tension, Compression, Bending and Torsion," by Joseph Marin, Yoh-Han Pao and George Cuff, Engineering Experiment Station, Penn State College, State College, Penna. A report on "Advances in Plastics in 1949-50," by H. M. Richardson, of DeBell & Richardson, Springfield, Mass., will also be given at the plastics session.

The ASME Rubber and Plastics Division welcomes all members of the rubber, plastic and allied industries to its technical sessions. A registration fee of $3.00 is required of non-members.

Moves New York Sales Office

The New York sales office of the B. F. Goodrich Chemical Co. has moved into new and spacious facilities in the Farmers Loan and Trust Company Building, 475 Fifth Avenue. Occupancy of the entire 24th floor of the building will provide additional offices and conference rooms necessitated by expanding operations. The offices have been located in smaller quarters in the same building since 1949.

LABOR NOTES

A ten-day strike at the plant of Pyramid Rubber at Ravenna, Ohio, was called off on October 7 when the union local accepted a wage increase offer made by the company. Women employees received a 10-cent-an-hour increase and male workers 12 cents. Union officials originally demanded a 25-cent-an-hour increase and the union shop.

After four previous attempts, the URW finally won the right to represent workers at the Johnson Rubber Co. plant in Middlefield, Ohio, in collective bargaining. Workers at the plant voted 355 for the URW and 253 for no union at an election held on October 5 conducted by the National Labor Relations Board.

Workers at the Providence, R. I., plant of U. S. Rubber voted on October 11 to retain the URW as sole bargaining agent. The vote was 2,280 against 377. The election was held by the NLRB at the request of an AFL union. URW has been the sole bargaining agent for the past two years.

Sun Rubber suffered a strike in mid-October following company action in disciplining a woman employee who is a committeewoman of the URA local. According to the company, she was disciplined because of the quality of her work and refused to accept assignment to a new job. The strike was of the wildcat variety with some workers returning earlier than others, pending negotiation of the dispute.

Naugahyde Elastic Upholstery

Elastic upholstery material, with a new high slip finish, has been developed by the U. S. Rubber Co., New York 20, N. Y., for use in automobiles, buses, trucks and furniture. Made of a new type of vinyl plastic, the material will stretch in every direction. Called Elastic Naugahyde, it is said that the material is soft and pliable and easily tailored. It combines a special elastic supporting fabric and an elastic plastic coating developed by U. S. Rubber. Service tested for almost two years, Elastic Naugahyde is being sold in rolls 30 to 40 yards long and 47 inches wide in a variety of colors. The upholstery material needs no wetting, special tools, tape or cement for application. It is highly resistant to scuffing and tearing, can be washed with soap and water and will not crack or flake. It is not harmed by oils, greases, gasolines or alkalies. It is also said to be resistant to weather.

Colburn Laboratories Expand

Colburn Laboratories, Inc., has moved to new and larger quarters at 732 South Federal St., Chicago, Ill. New equipment and facilities at the expanded laboratories permit research and analysis in surface active agents, rubber, plastics, and other branches of general organic work. Several special departments at the new location are devoted to photomicrography, spectrography, bacteriology, microanalysis, etc.

NPA CLARIFIES SITUATION ON BUTADIENE-STYRENE COPOLYMERS

In a recent release, the Industry Operations Bureau of the National Production Authority attempted to clear up the confusion as to the reporting requirements covering butadiene-styrene copolymers produced privately by industry. The Bureau took into account the fact that some time ago the Office of Rubber Reserve agreed to limit its production of butadiene-styrene rubber and latex to types containing not more than 50% styrene, leaving the field over 50% to private industry. This, said the Bureau, was construed in some quarters to mean that butadiene-styrene copolymers containing over 50% styrene were not rubber.

To clarify this situation, the Bureau of Standards has made appropriate studies and has reported that these butadiene-styrene copolymers containing up to and including 70% styrene have distinguishable rubberlike qualities and can be vulcanized. Therefore, under authority of Public Law 469 (extended by Public Law 575), Section 18(d), and Executive Order 9942, all butadiene-styrene copolymers containing up to and including 70% styrene have been determined to be rubber and subject to rubber controls, including the reporting requirement.

According to the NPA Industry Operations Bureau, data on butadiene-styrene copolymers containing 70% or less styrene should be reported monthly on Form IC-3410, Column C "GR-S Types Including Latex". Probably this caption is not quite appropriate but it will be corrected in an early revision of the form, the Bureau stated.

The Industry Operations Bureau also called attention to the fact that consumption of this material is rubber consumption, regardless of the end-product for which it is used. Considerable quantities of butadiene-styrene copolymers with 70% or less styrene are used in producing non-rubber products. However, this does not alter the fact that it constitutes rubber consumption.

Pyramid Sued For $353,982

Mrs. Margaret F. Wible of Jeannette, Penna., has filed suit in Federal Court in Cleveland, Ohio, for $353,982, charging she was defrauded in the deal by which ownership of the Pyramid Rubber Co. of Ravenna, Ohio, changed hands in 1947. In her suit, Mrs. Wible said that officials of the company persuaded her to sell her stock in the company a week before a Texas syndicate took over control. Mrs. Wible received $2,300 a share for her 85 shares. In the final deal, the Texas group paid $7,700 a share. Mrs. Wible wants the larger sum which she said she would have received if she held her stock until the company was sold. W. B. McIntosh of Akron, former president of Pyramid, is one of the defendants in the suit. Mr. McIntosh said that Mrs. Wible was fully informed of all the facts involved in the transaction. "I have been aware of the Wible claim for some time, and have rejected it as being without foundation morally or legally," Mr. McIntosh said.

Named General Sales Manager

Eugene Ward

Eugene Ward, formerly assistant sales manager of the Cameron Machine Co., Brooklyn 2, N. Y., has been appointed general sales manager of the company. Mr. Ward has been associated with Cameron for the past 13 years. He was assistant service manager from 1945 to 1948 at which time he was made manager of the Service Department. In February of 1950, he was appointed assistant sales manager. During World War II, Mr. Ward served with the Army in the European Theater. He attended New York University and Hofstra College, majoring in business administration. He also completed studies at Brooklyn Polytechnic Institute in pulp and paper technology.

Prices Raised For PVC Resins

Naugatuck Chemical Division of the U. S. Rubber Co. has announced price increases for its polyvinyl chloride resins effective immediately. The rises ranged from 2 to 4 cents a pound and include freight charges. The old prices were quoted f.o.b. Painesville, Ohio. The advances included both the Marvinol VR-10 and VR-20 resins. Company spokesmen said the increases were made necessary because of steadily rising raw material and labor costs. The minimum price for both resins is now 36 cents per pound in lots of 20,000 pounds or more. The previous price was 33 cents per pound in lots of 30,000 pounds or more. It was possible to lower the large quantity minimum, the company said, because the increasing use of full truck load shipments makes it as economical to handle 20,000 pounds as 30,000 pound lots.

Textileather Acquires Warehouse

The Textileather Corporation, Toledo, Ohio, recently purchased the plant formerly occupied in Toledo by the American Swiss Co. The buildings, containing approximately 100,000 square feet of floor space, will be used primarily for storage purposes.

Silicone Production in England

Dow Corning Corp., Midland, Mich., has announced that silicone fluids, lubricants, resins and rubbers will now be manufactured in England. The project is the joint effort of Dow Corning and Albright and Wilson, Ltd., of Oldbury, Birmingham. The latter company is presently designing a manufacturing plant using Dow Corning engineering assistance. The plant will eventually produce the complete lines of silicones developed by Dow Corning in the United States. The project will be further implemented through two newly-registered privately-owned British companies. One is Dow Corning, Ltd., a wholly-owned subsidiary which will engage in licensing the British patents of Dow Corning in the organo-silicon field. The other is a sales company, Midland Silicones, Ltd., of London, which is jointly owned by Albright and Wilson and Dow Corning, Ltd. Midland Silicones will be responsible for marketing the silicones produced by Albright and Wilson and will take over the general distributorship of Dow Corning products in the United Kingdom. The production of silicones in the United Kingdom has received the approval of the Bank of England, the Board of Trade and the Ministry of Supply.

Plans Progressing for Meeting

Considerable progress has been made in connection with the plans for the 1951 International Union and International Congress which will be held during the week of September 10, 1951, in New York and Washington, D. C. The Diamond Jubilee Meeting of the American Chemical Society will be held in New York the preceding week. The International Congress will feature 16 sections, encompassing all areas of modern chemistry. R. P. Dinsmore, vice-president of the Goodyear Tire & Rubber Co., has been named chairman of the Section on Elastomers and Plastomers, which will include natural and synthetic fibers, resins, rubbers, textiles, drying oils, paint, varnish, coatings, glass, and ceramics. H. Mark, of the Polytechnic Institute of Brooklyn, has been named chairman of the Section on Macromolecules, which will include structure, theory of polymerization, and silicone polymers.

Buys DuPont Chromic Acid Line

Diamond Alkali Co., Cleveland 14, Ohio, has purchased the chromic acid business of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., for an undisclosed price. The product will continue to be manufactured by DuPont at its Philadelphia, Penna., plant, and, under the terms of the sale, Diamond Alkali will take over distribution of the product on January 1, 1951. Diamond Alkali is a major manufacturer of sodium bichromate, an essential raw material used in the manufacture of chromic acid, with facilities located both at Kearny, N. J., and Painesville, Ohio. Nearing completion at both these units is a rehabilitation, modernization, and expansion program costing approximately $5,000,000.

Elwell Joins General Latex

Robert H. Elwell

Robert H. Elwell, son of Harvey J. Elwell, the late president of the General Latex & Chemical Corp., Cambridge 39, Mass., has joined the firm as assistant to the vice-president in charge of production. Robert H. Elwell graduated from Yale University in 1946, and since that time has been employed with the International Telephone & Telegraph Corp. He has been associated with the Operating Department of the Cuban Telephone Co., the Sales Department of the Federal Telephone & Radio Corp., and the Remote Control Department of Standard Telephones & Cables, Ltd. At the time of his resignation from I. T. & T., he was engineer in charge of airline projects.

Skid-Proofing Streetcar Tracks

The City of Akron, Ohio, is presently testing a new method of skid-proofing streetcar tracks with a new adhesive developed by the Goodyear Tire & Rubber Co. The problem had been that in placing surfacing materials over old streetcar tracks, the asphalt used in the surfacing material would not adhere to the metal rails. In the new procedure, the rails are cleaned to remove dirt and rust after which the new adhesive is applied with brushes. Asphalt is then applied over the rail and into the rail groove. Sand is worked into the asphalt to give it even better anti-skid qualities. Samples of the new adhesive have been sent to the U. S. Bureau of Public Roads. The compound may be useful as a coating for underground metal pipes. The new adhesive is expected to increase the adhering qualities of asphalt to the streetcar track by at least six times.

Requests Bids On Rubber Roads

Bids are being sought in Massachusetts on a record $2,637,210 highway resurfacing program, it was recently announced. Rubber compounds will be added to the asphalt in eight projects as a result of favorable experiments indicating that "rubber roads" are tougher, smoother and more durable than conventional highways.

PRIORITY RATINGS ESTABLISHED BY NPA FOR ALL DEFENSE NEEDS

The Government on Oct. 3 set up a limited priority system to make sure military orders get first call on the nation's materials and productive capacity. The priority order—issued by the National Production Authority—simply prescribes a single "rating" which the Defense Department and Atomic Energy Commission can use to force most producers of raw materials or manufacturers of finished products to make delivery on defense orders ahead of any other orders. The rating could also be used by the producer to make sure he gets the materials he needs to carry out the contract.

The priority ratings would be available not only for all future orders but also for any military or A.E.C. orders already outstanding. At least for the time being, there will be no complicated scale of priorities, such as was used in the last war, giving some defense contracts preference over others.

The order makes no provision for any sort of priority for non-military orders—even for such "essential" items as freight cars or oil pipelines. But N.P.A. administrator William H. Harrison said "measures are being considered" to make it easier for manufacturing "in direct support" of the defense effort to get necessary scarce materials.

Scope of the Order

The new priority regulation applies to armed forces and A.E.C. buying of products and materials directly under the jurisdiction of N.P.A. This includes most industrial commodities, but it specifically exempts such items as electric power, farm machinery, food and petroleum, which fall in the bailiwicks of other Government agencies. It's to be expected, however, that these agencies, including the Agriculture and Interior Departments, will soon come up with similar regulations covering the products under their jurisdictions.

Also exempt from the N.P.A. regulation are products purchased by the military which are primarily non-military in character, such as office equipment or articles to be sold in post exchanges.

The priority rating will be known officially as a "DO" (Defense Order) rating. It will be issued by the Defense Department or the A.E.C. to manufacturers or producers who supply these agencies directly. Direct or "prime" military contractors will be allowed to pass on the rating to their suppliers to get the materials, semi-finished articles and "components" they need to make the end-product ordered.

For example, an auto manufacturer gets a "rated" order from the Army to build tanks. When he orders the steel plates and sheets he needs to fill the order, he will stamp the letters "DO," plus a number given the tank contract by the Army, on his contract with the steel mill. If the mill can't take care of its civilian orders and still deliver the tank steel on time, it must then delay the civilian orders.

Perhaps the auto manufacturer has to farm out some of the fabricating work on the original contract. He orders gears for the tanks from a specialized gear producer. Besides requiring the gear maker to give preference to his order, he can authorize the gear producer to use the same priority to get quick delivery on the steel he needs for the gears.

Requirements of Regulation

The new regulation requires a producer to accept all rated defense orders offered him, except under special conditions. He "must not" accept an order if completing it on time would interfere with delivery of other rated contracts he had previously accepted. This applies to "sub-contractors" making materials or parts for the original order, as well as to the "prime contractors."

A producer can also turn down a priority-backed order if the customer—whether it's the Army, A.E.C. or just another manufacturer with a rated contract—isn't willing to meet "regularly established prices and terms of sale or payment." He wouldn't have to take the order, either, if it calls for a kind of production he doesn't normally do or if it would "cause a substantial loss of total production or a substantial delay in operations."

Once a procurer accepted a rated contract, however, he would be committed to filling it by the delivery date. Each order will carry a specific delivery date or require delivery within no more than 90 days after a specified date. There were indications that N.P.A. would soon follow up its priorities order with some action to spread military demands evenly among producers of scarce basic materials.

Possibility of Special Directives

The N.P.A. said that it might issue "special directives or authorizations" itself which would take precedence over priority ratings issued by the military agencies and A.E.C. Officials said these directives could be used in special cases, to provide quick delivery of materials for tooling up a defense plant.

If manufacturers cut down their own inventories of materials to fill a defense order, they could use their priority to replace their stocks. But they could not use it to build to more than a "practicable minimum working inventory" their stocks of "scarce" materials covered by N.P.A.'s inventory regulation, issued two weeks ago.

Every business which uses a "DO" priority must keep records of each rated transaction for two years and make them available for inspection by N.P.A. Violators of the priority regulation will be liable to fine or imprisonment or both, according to Administrator Harrison. They might also be barred from all future participation in the priorities system.

United Rubber Buys Texas Firm

United Rubber Corporation, Los Angeles 13, Calif., has announced the recent acquisition of the Texas Tire & Rubber Co. at Grand Prairie, Tex. The Texas firm, formerly operated by the American Wagum Rubber Co., has been renamed the United Rubber Corporation of Texas, and will operate independently of the Los Angeles parent firm. United Rubber Corp. of Texas, however, has acquired an exclusive franchise from the United Rubber Corp. of Los Angeles for the manufacture of Excello and other types and grades of camelback. The Texas firm will also produce tire repair materials and mechanical rubber goods. The firm will also process and reclaim all types of rubber. Nathan Kaplan, president of the Los Angeles firm, is also president of the Texas company; Sam Kaplan is vice-president, and Harry Dubow is secretary-treasurer and general manager. James R. Kendall, former plant manager of the Texas firm, will continue in the same position for the new owners.

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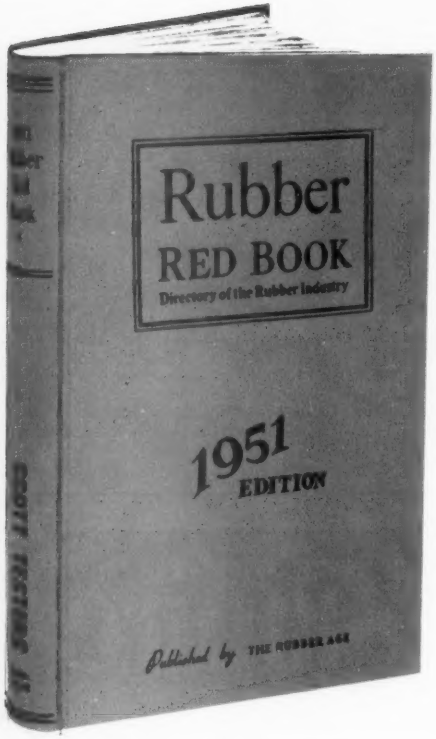

The Eighth issue of the RUBBER RED BOOK—the 1951 edition—is scheduled for publication in April, 1951.

As usual, the forthcoming edition will have various improvements and up-to-the-minute corrections and additions to keep pace with the growth and progress of the rubber industry. This constant improvement in each succeeding edition is the key to the continued acceptance and wide use of the RUBBER RED BOOK by the important men in the rubber field . . . and that's why it is such an outstanding advertising medium for suppliers to the industry.

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Colors, Red	extra	$60.	
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CLOSING DATE for Copy — February 1, 1951

PUBLICATION DATE — April 1, 1951

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LOS ANGELES NEWS

The first Fall Meeting of the Los Angeles Rubber Group was held on October 3 at the Mayfair Hotel in Los Angeles, Calif. The technical group meeting was addressed by Harry G. Bimmerman, director of the rubber laboratory of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Mr. Bimmerman spoke on "Compounding Neoprene Products for Resistance to Petroleum Gases." The dinner meeting was addressed by Dr. Howard S. McDonald, president of the Los Angeles State College of Applied Arts and Sciences and of the Los Angeles City College.

In his address, Dr. Bimmerman noted that elastomeric products used in the oil industry are required to meet extremely severe service conditions. The increasing depths of wells brings higher pressures and temperatures into play. In the past, considerable emphasis has been placed on the resistance to swell in oil of the products being used. Some failures have occured, however, which indicate that swelling is not the entire story.

Manufacturers of rubber goods and oil well supplies have tested their products in various types of pressure equipment in order to obtain information of this nature, Mr. Bimmerman said. He then recounted studies which have been made on neoprene compounds relative to the general problem. Mr. Bimmerman's paper appears in full elsewhere in this issue.

Approximately 40 members of the Los Angeles Rubber Group participated in the monthly golf tournament held on September 29 at the Oakmont Country Club in Glendale, Calif. The following members won prizes for the different golfing events: *Blind Bogey*, J. W. Gordon (Para Plate & Plastics); *Low Net*, Joe Hoefle (Plastic & Rubber Products); *Low Total Putts*, Chuck Findlay (Shell Oil) and William Michalak (Plastic & Rubber Products); *Low Gross*, Al Pickard (Braun); *Best Tee Shot — 11th Hole*, R. L. Bowen (Xylos Rubber); *Longest Drive From 17th Tee*, Richard Hill (Para Plate & Plastics); *Longest Putt 18th Green*, J. D. McConnie (Plastic & Rubber Products); *High Score—Blind Hole*, E. C. McLaughlin (H. M. Royal).

Goodyear Tire & Rubber Co. has announced the installation of equipment to produce Airfoam cushioning material at its Los Angeles plant, now observing the 30th anniversary of its West Coast operations. Installation work has been underway for several months and production is expected to be started shortly after the first of the year unless Governmental restrictions on the use of liquid latex then make it prohibitive.

The output of the Los Angeles plant will supply automotive seating and furniture manufacturers in the western part of the country. The operation will provide employment for approximately 100 persons. The new equipment is patterned after units installed in Akron.

In addition to production equipment, Goodyear is rushing to completion a bulking plant to receive liquid latex from tankers coming from the Far east. At the bulking plant, the liquid rubber will be pumped into storage tanks where it will be transferred to glass-lined tank cars for transit to Goodyear's production operations.

Curtis Wolters has resigned his position with the Witco Chemical Co. to accept a position with the California Rubber Products Co.

Gilbert C. Dohm, associated with U. S. Industrial Chemicals and an active member of the Los Angeles Rubber Group for many years, passed away on July 13, 1950.

William H. Aston, production superintendent of the Patterson-Ballagh Division of the Byron Jackson Co., died on September 18.

Charles H. Sager, associated with the Purchasing Department of the U. S. Rubber Co., died of a heart attack at his home on September 15.

Tommy Tomkins, formerly associated with the U. S. Rubber Co. at the Government-owned synthetic rubber plant in Torrance, Calif., died in New York City in July. Mr. Tomkins was a former member of the Los Angeles Rubber Group.

The final golf tournament of the 1950 season was scheduled to be held on November 3 at the Wilshire Country Club in Los Angeles by the Los Angeles Rubber Group.

The Oliver Processing Co., 1580 East Slauson Ave., has transferred all of its business to the Wade Sponge & Rubber Co., a new California corporation, of which Robert O. Wade is president. There has been no change of ownership other than in the formation of the new corporation.

New England Group Hears Cabot

Thomas D. Cabot, vice-president of Godfrey L. Cabot, Inc., was principal speaker at the October 4 General Assembly Dinner of the New England Council. Favoring the expansion of company research programs wherever possible, he said, "Despite the fact that research today is generally recognized as the principal tool of competition, it is undersold." Mr. Cabot paid tribute to the Council's activities, to Boston as a center for research, and to the companies which have demonstrated through their yearly success that research programs can be entirely profitable.

Essex Wire Increases Loan

Essex Wire Co., Fort Wayne 6, Ind., has announced that it has arranged to borrow an additional $3,000,000 from an insurance company, raising the total borrowed amount to $7,840,000. The loan was arranged through Lehman Brothers and Commercial Investment Trust, Inc. The loans will mature in 1965. The new loan will bear interest at 3%, as against a rate of 3½% on the previous borrowings.

Pictured above are (left) Dixon Shepard, programming chairman of the Los Angeles Rubber Group and (right) R. D. Abbott, associate chairman of the group, with (center) H. G. Bimmerman who addressed the October 3 meeting of the group.

Burnham Named Purchasing Agent

R. G. Burnham

Standard Products Co., 2130 West 110th St., Cleveland 2, Ohio, has announced the appointment of R. G. Burnham as director of purchases for the company. Mr. Burnham will coordinate purchases and purchasing policies of the company's six manufacturing divisions, while the actual purchasing will continue to be carried out at the various plants. Mr. Burnham is a former director of purchases for the National Screw and Manufacturing Co., and later was vice-president of the American Rivet and Manufacturing Co., which he still serves as a member of the board of directors. He is a graduate of the University of Michigan.

DL Lining for Latex Shipments

The Wax and Oil Division of Allied Asphalt and Mineral Corp., New York 7, N. Y., has developed a new storage lining material for drums and tank cars used for natural rubber latex shipments. By selection from the myriad waxes derived from petroleum production, Allied has developed a wax which is said to incorporate the necessary qualities for a liner that will protect latex from the adverse effects of contact with steel. Named "DL," the wax is chemically neutral, and has excellent flexibility and metal adhesion. Easily applied, the wax has a melting point of 168° F. ± 2½° F. and a penetration of 28 ± 2.

Data on Carbon Blacks

The Binney & Smith Co., 41 East 42nd St., New York 17, N. Y., has prepared a brochure furnishing data on its various grades of carbon black for the rubber, protective coatings and ink industries. The mean particle diameter, surface area, pH, and structure index of the various blacks is given, as well as physicals on typical natural rubber and GR-S stocks. The brochure also contains data on the company's Mapico pigments, carbon black base dispersions, and aqueous colloidal black dispersions. Copies are available from the company on request.

Chemists' Group Opens N. Y. Office

The Manufacturing Chemists' Association, Inc., has opened an office at 330 West 42nd Street, New York, under the direction of Robert L. Taylor, executive vice-president. This is in addition to the Association's present offices in the Woodward Building, Washington, D. C. Activities of the new office will be devoted initially to public relations matters and the servicing of member needs and Association affairs in the New York area. The Washington staff, under the direction of the secretary, M. F. Crass, Jr., will continue to handle committee activities, transportation matters, and preparation and publication of the Association's bulletins, technical reports and safety data sheets. Plastics activities will also continue at this location under F. H. Carman. The Manufacturing Chemists' Association is a trade association of chemical manufacturers in the United States, organized in 1872. Its member firms account for over 90 per cent of the production of chemicals and plastics in this country.

Flintkote Foam Rubber Adhesive

The Industrial Products Division of the Flintkote Co., 30 Rockefeller Plaza, New York 20, N. Y., has announced the development of Flintkote Foam Rubber Adhesive. The product is a specially compounded solvent type cement for the joining of foam rubber. It is a one part adhesive, not requiring the addition or mixing of an accelerator. Amber transparent in color, the product has the consistency of thin glue and is easily spread by brush. Combining may be accomplished without waiting for the cement to become tacky as the "short tack" characteristic of the cement permits joining within one minute. On the other hand, the tack range can be extended if the assembly operation requires slower handling.

Develops Plastic Toy Process

Sun Rubber Co., Barberton, Ohio, after two years of research, has developed a new line of vinyl plastic toys which are being manufactured by a new process. Sun Rubber's chemical and development engineers have come up with what the company believes to be the finest molded vinyls ever produced. First product in the new line is "Mickey Mouse." The mouse is a squeeze-type toy, standing upright, about 6 inches high, with a whistle on the bottom of the feet. He has a pink face, solid black head and body, bright red pants, yellow shoes and pink gloves.

Goodrich Buys Harmon Color

B. F. Goodrich Chemical Co. has completed arrangements for the purchase of the Harmon Color Works, Inc., a subsidiary of American Home Products Co. Harmon Color Works has been engaged in the manufacture of organic color pigments and dyes in two plants located at Kearny and Haledon, N. J. Following completion of the transaction, Harmon Color will continue to operate in the same business at the present locations as a Goodrich subsidiary.

Silver Joins Mohawk Rubber

Frank F. Silver

Frank F. Silver, formerly associated with the Goodyear Tire & Rubber Co., has joined the engineering staff of the Mohawk Rubber Co., Akron, Ohio. Up to the time of his new appointment, Mr. Silver had been in South Africa, where he was in charge of technical service and tire design for Goodyear for three and one-half years. In 1943-44, Mr. Silver was in Calcutta, India, for Goodyear, doing technical work on tires for the Air Force at the Dunlop factory there. In 1942, he was on the Goodyear Training Squadron at Jackson, Mich. Mr. Silver is an engineering graduate of Iowa State College.

Organic Synthesis Group Formed

Establishment of an Organic Synthesis Group to synthesize compounds not generally available through commercial supply houses has been announced by Atlantic Research Corporation, research and development firm with laboratories in Alexandria, Virginia. The service is being instituted to fill the increasing need for additional "custom" synthesis facilities in the chemical industry and to provide a source of supply for not-readily-available compounds called for in research programs. Work being undertaken includes synthesis of compounds that have not been characterized or reported in the chemical literature. Present projects of this group of specialists range from compounds needed in industry to those required for medical research and pharmaceutical testing programs. Modern laboratory facilities and a highly skilled staff have been allocated to the program.

Connecticut Group Officers

As a result of balloting by members of the Connecticut Rubber Group, the following officers have been elected to serve in 1951: *Chairman*, C. A. Larson (Whitney-Blake); *Vice-Chairman*, G. R. Sprague (Sponge Rubber Products); *Secretary*, G. A. Di Norscia (Sponge Rubber Products); *Treasurer*, F. J. Rooney (General Electric). R. B. Norton (Kerite) and E. W. Owens (U. S. Rubber, Naugatuck) were elected directors of the group for the 1951 season.

CANADIAN NEWS

Communist influence among Asia's industrial workers is meeting effective resistance in the form of a new deal in labor relations for employees of a number of British and American branch plants, according to Albert Healey, a director of the Dunlop Rubber Co., Ltd., who recently visited Toronto after business trips to Japan, India, Malaya, and several European countries.

A quiet-spoken, gray-haired Briton, Mr. Healey is responsible for production and research in the world-wide group of Dunlop companies and for policies covering relations with 84,000 employees on five continents. These include hundreds of workers on the company's Malayan rubber estates who have been enrolled as special constables or provided with armored cars and tommy-guns for protection against raids by Communist bandits.

"The onus is on management to improve relations with workers in all countries but particularly those in places openly exposed to Communist influence," Mr. Healey indicated. He blamed past omissions of many western firms operating in Asiatic countries for several recent political successes achieved by the Communists.

Mr. Healey credited the management of Dunlop's Calcutta plant with helping to pioneer the new approach in India where, he said, relations between the Indians and British have improved considerably since the granting of independence.

Labor policies in the Calcutta factory, which employs 7,000 men and women, take into consideration the needs and aspirations of the humblest workers, Mr. Healey explained. He described the basis of harmonious conditions as the recognition afforded native foremen and department supervisors.

"To most workers, these people are the bosses. They are taught the right approach to human relations, and every effort is made to protect their status as representatives of management," he said.

Only the manager and a handful of key executives in the Calcutta works are Europeans. They keep in touch with employees through the foremen and through pamphlets, printed in native languages, that dispel rumors by giving the workers facts about lay-offs, new production methods and other important developments, he added.

While the results achieved by firms providing a new deal in employee relations showed clearly that Communist propaganda could be combatted effectively, their influence was necessarily limited and localized, Mr. Healey stated.

Despite the example set by the enlightened companies, too many firms were still clinging to old attitudes. As a result, Indian labor as a whole was highly susceptible to Communist appeals, he added.

According to Mr. Healey, banditry in Malaya, where upwards of half the world's supply of natural rubber is produced, took a more violent turn recently as Communists began a series of reprisal raids following stepped-up military operations against them. So far, however, it has not slowed down rubber collection.

The tire factory of the Dominion Rubber Co. at Kitchener, Ontario, suffered a short strike last month when some 1100 rubber workers left the factory as the result of the discharge of a maintenance employee. The walk-out was in no way connected with the recent demand of the union for a 31-cent-an-hour increase in wages. Although management claimed the employee in question was dismissed for malingering, or failing to do a reasonable day's work for a good day's pay, the union claimed he was discharged unjustly. The men returned to work pending negotiation of the dispute. Management refused to negotiate before this action was taken.

Two recent appointments in the Dunlop Tire & Rubber Goods Co., Ltd., were recently announced by Harry S. Pritchard, general sales manager. Chris. T. Snidal was named as sales manager of Industrial Rubber and Dunlopillo Products in the Ontario Branch, and W. McMillan was named manager of the British Columbia Branch. Mr. Snidal, until recently manager of the company's branch in British Columbia, has served Dunlop in various capacities for nearly 30 years. Mr. McMillan has served the company for the past 13 years in various sales capacities.

Swift Canadian Co., Ltd., of Toronto, recently opened a new plant at Westminster, British Columbia, its fourth in Canada devoted to the production of all types of adhesives, including a number of resin and rubber-based emulsions. The company has also reported that recent research has resulted in new types of adhesives which set almost immediately, and are waterproof, bacteriaproof and greaseproof.

A 5% increase in the prices of its tires and tubes for automotive vehicles was announced last month by the Dunlop Tire & Rubber Goods Co., Ltd. The company said a recent tax increase was responsible for the price advance.

Geoffrey K. Wright, technical representative and manager of the Toronto branch of Shawinigan Chemicals, Ltd., was recently elected a Councillor of the Chemical Institute of Canada. Mr. Wright is also chairman of the Toronto Section of the Institute.

A new folder on Cyclon Corrosion Resistant Materials of Construction is now being offered by Munray Products, Inc., Division of Poly-Cyclo Products Co., Cleveland 11, Ohio.

Additional Names in the News

LYMAN H. ALLEN, JR., formerly assistant chief design engineer in charge of chemical process design with the American Viscose Corp. in Philadelphia, Penna., has been appointed chief engineer of Foster D. Snell, Inc., New York 11, N. Y.

D. W. HOLMES, for the past four years general sales manager of the Parker Appliance Co., Inc., Cleveland 10, Ohio, has been elected vice-president in charge of sales.

F. M. HALL, previously associated with the Research Laboratories of the National Lead Co. in Brooklyn 1, N. Y., has joined the Baker Castor Oil Co. in charge of the Rubber and Plastics Laboratory at Bayonne, N. J.

SIDNEY I. PIKE, president of S. I. Pike, Inc., New York 7, N. Y., has returned to the United States after a recent trip to South America where he visited with various exporters with whom his company deals.

DR. NICOL H. SMITH, formerly director of research operations of the Research and Development Laboratories of the Franklin Institute, Philadelphia 3, Penna., has been appointed executive director of the laboratories.

JOHN W. DALY, formerly purchasing agent of the Brunswick-Balke-Collender Co., Chicago, Ill., has been appointed assistant to the president of the Triem Steel & Processing Co., Chicago Heights, Ill.

CHARLES M. BALDWIN, associated with the United Carbon Co. for the past 20 years as branch manager in Chicago, Ill., recently celebrated 30 years in the rubber industry.

A. RAY CARR, formerly manager of sales promotion for the General Tire & Rubber Co., Akron, Ohio, has been appointed manager of Kraft Service and Accessory Sales for the company.

GEORGE L. FENN, secretary and assistant treasurer of the Adamson-United Co., Akron 4, Ohio, has been elected to the company's board of directors.

EMIL F. FREY, previously assistant sales manager of the De Vilbiss Co., Toledo, Ohio, has been appointed director of sales promotion and advertising for the company.

MORRIS S. ROSENTHAL, president of Stein, Hall & Co., Inc., New York, N. Y., has been elected chairman of the board of the International Business Relations Council.

HARVEY S. FIRESTONE, JR., board chairman of the Firestone Tire & Rubber Co., recently received his 30th anniversary service pin from the company. Although closely associated with company affairs for some time, he officially became a company employee in 1920.

THE STORY BEHIND THE WORD...

OK...

When Martin Van Buren ran for his second term of office a club was formed in New York to support him.

This club, started in 1840, was named after Van Buren's early home in Old Kinderhook, N. Y.

Taking the initial letters of this town it was known as the OK Club and its rallying cry of approval was "OK".

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OBITUARIES

Henry A. Steinmetz

Henry A. Steinmetz, assistant treasurer of the U. S. Rubber Co., died of a heart attack on October 7 at his home in Scarsdale, N. Y. He was 56 years old. Mr. Steinmetz was born in New York City on December 6, 1893, and attended Columbia University. He served as an examiner for the Federal Trade Commission from 1916 to 1919. In 1919, Mr. Steinmetz joined U. S. Rubber at the general offices in New York. From 1929 to 1932 he was assistant control manager at the company's footwear plant in Naugatuck, Conn. He had been assistant treasurer of the company since 1936, with offices in New York City. In this capacity, he had been in charge of all manufacturing accounting. He took an active part in the organization of the company's military activities during World War II. Mr. Steinmetz was a member of the F. & A. M., and the 25-Year Club of U. S. Rubber. Funeral services were held on October 8 in New York City with interment in Woodlawn Cemetery. His son and daughter survive.

Otto E. Kretchmer

Otto E. Kretchmer, president of the Peerless Imperial Co., Inc., of Newark, N. J., died at his home in Newark on October 12. He was 63 years old. Born in Brooklyn, N. Y., Mr. Kretchmer studied law at the New Jersey Law School in Newark, and was admitted to the bar in 1916, although he never actively practiced law. In 1914, Mr. Kretchmer had become a stenographer for the old Imperial Manufacturing Co. of Newark, of which the present Peerless Imperial is the successor. He was elected president of the company in 1920. In 1946, he became a member of the Newark Central Planning Board and of the Newark Housing Authority. He held these posts at the time of his death. Mr. Kretchmer was a member of many civic and fraternal organizations. He leaves his mother and a son.

William J. Forbes

William J. Forbes, president of Allpax, Inc., of Mamaroneck, N. Y., makers of asbestos and rubber packing material, died on October 4 in New York Hospital, New York, N. Y. He was 56 years old. Born in Shelton, Conn., Mr. Forbes started his career as Indianapolis, Ind., manager for the Dominion Asbestos and Rubber Co. Later, he served with various firms in the same field before the formation of Forbes & Walker, Inc., of Mamaroneck in 1927, and of Allpax, Inc., a year later. At the time of his death he was president of the Allpax Rubber Products Corp. and the Allpax Realty Corp. Mr. Forbes served in the Army during the first World War. He was a member of the Winged Foot Golf Club and the Larchmont Yacht Club. His wife, two sons and a daughter survive.

Raymond M. Warner

Raymond M. Warner, chief compounder of the Miller Division of the B. F. Goodrich Co. at Akron, died of a heart attack on October 14 at his home in Barberton, Ohio. He was 57 years old. Born in Barberton, Mr. Warner was a graduate of the University of Akron and had been associated with Goodrich for the past 34 years. Mr. Warner was a past patron of Jeannette Chapter 212, OES, past master of National Lodge 568, F. & A. M., a member of the Portage Chapter 202, R.A.M., and served as First Ward Councilman in Barberton from 1935 to 1937. Services were held on October 16 at the First United Presbyterian Church in Barberton with interment in Greenlawn Memorial Park. He leaves his wife and two sons.

Alvin J. Musselman

Alvin J. Musselman, well-known inventor once employed by the Goodyear Tire & Rubber Co. in Akron, Ohio, died recently at his home in Santa Barbara, Calif. He was 77 years old. Born on a farm near Mason City, Ill., Mr. Musselman was identified with the bicycle trade most of his life. He was the inventor of a bicycle coaster brake that bears his name and also was credited with other inventions pertaining to bicycles. While with Goodyear, Mr. Musselman was active in the Tire Development Department. He helped to pioneer an oversized low pressure pneumatic tire for light airplanes, and helped in the development of an airplane brake. He leaves his wife, a son and a daughter.

Karl W. Haller

Karl W. Haller, associated with the U. S. Rubber Co. as general accountant of the synthetic rubber plant at Institute, W. Va., died of a heart attack on October 21 while playing golf at Charleston, W. Va. He was 56 years old. Mr. Haller first joined U. S. Rubber in 1919 as an assistant in the Tire Department. During World War II, he served as a special expediter for the Government-owned synthetic rubber plant at Institute which was operated by U. S. Rubber. Mr. Haller leaves his wife and two daughters.

Harold P. Meek

Harold Patterson Meek, president of Meek & Co., New York, N. Y., special agents for the B. F. Goodrich Co., died at his home in Bayside, L. I., N. Y., on October 20. He was 58 years old. Born in Allenwood, Penna., Mr. Meek was a graduate of Lockhaven Teachers College in Lockhaven, Penna., and for a time attended Bucknell University. His wife and son survive.

Elmer Clark

Elmer Clark, manager of engineering shop and maintenance for the Goodyear Tire & Rubber Co., Akron, Ohio, since 1917, died on October 17 at his home in Akron. He was 68 years old. Born in Bath Township, Ohio, Mr. Clark started with the company in 1911 as general foreman of the machine shop. In addition, for a short period he was superintendent of the firm's airship building operations at what is now the Goodyear Aircraft Corp. Prior to joining Goodyear, Mr. Clark was associated with several other Akron concerns as machinist and engineer. He was a member of all Masonic bodies and the Akron City Club. His wife survives.

Non-Metallic Bearings Book

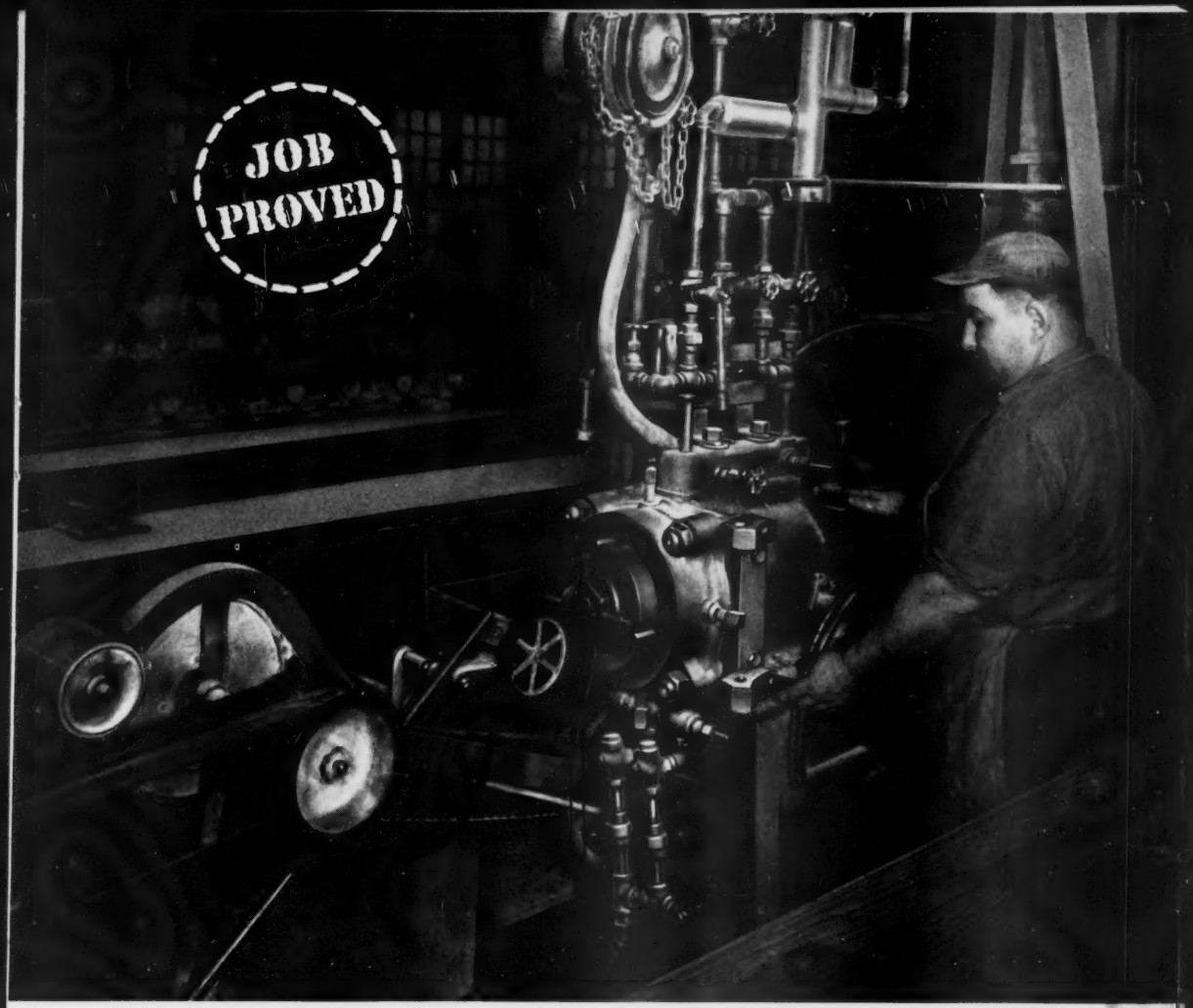
The Engineering Societies Library, 29 West 39th St., New York 18, N. Y., has prepared an annotated bibliography of 101 selected references to the literature of the past 12 years which covers all aspects of non-metallic bearings such as their manufacture, design, properties, wear, lubrication, performance, testing and applications. Bearings made of rubber, wood, laminated phenolic plastics, resin-impregnated cotton fabric, micarta and nylon are discussed. Applications discussed are for rolling mills, marine propeller shafts and rudder posts, automatic presses, axle bearings for railroad rolling stock, agricultural machines, etc. Copies are available from the Engineering Societies Library at $2.00 each.

Enlarges N. J. Titanium Plant

National Lead Co., New York, N. Y., has announced plans for "substantially" enlarging its titanium plant facilities at Sayreville, N. J. The company said the additional facilities are intended to meet the steadily increasing demand for titanium dioxide pigments for the current industrial mobilization program. When completed in about 15 months, the new facilities will provide the company with about 150,000 square feet of additional floor space. This, together with a similar expansion program the company has under way at the St. Louis plant, will enable it to boost production of titanium dioxide pigments by 60,000 to 70,000 tons annually.

Quebec Groups Hears Crocker

Approximately 60 members and guests of the Quebec Rubber and Plastics Group attended the Fall Meeting held on October 19 at the Queen's Hotel in Montreal, Que., Canada. Principal speaker at the meeting was E. Charlton Crocker of the General Latex & Chemical Corp., Cambridge, Mass. Mr. Crocker spoke on "Latex Foam Sponge Rubber—Method of Manufacture, Trends Towards New Equipment and the Growth Pattern of the Industry." Mr. Crocker's address was similar to one he delivered before the Chicago Rubber Group on October 6, a full report of which appears elsewhere in this issue.



REJECTS DUE TO SCORCHING ELIMINATED

Circo Light Rubber-Process Aid Reduces Internal Heat in Stocks; Improves Plasticization, Simplifies Extruding

If rubber is plasticized right, it will extrude into tube form without scorching. But to find the perfect plasticizer is easier said than done. One well-known manufacturer of mechanical rubber goods experimented with a great many rubber-process aids before he discovered what he was looking for. Not one of them could prevent the neoprene from scorching, and the losses through rejects ran high.

The problem was solved by Circo Light Rubber-Process Aid, recommended by a Sun technical man. By properly conditioning the stock, making it easier to work, this "Job Proved" Sun product speeded up the extruding process, and prevented scorching. Operating speeds increased. Quality improved. Rejects dropped to a minimum. And whites did not stain. The company has been using "Circo" for many years now with excellent results on neoprene, reclaim, and GR-S stock.

Circo Light Rubber-Process Aid is not an ordinary petroleum-base oil. It is a "Job-Proved" petroleum-derived process aid made under precisely controlled conditions specially for rubber compounding. It has a high degree of naphthenicity and its composition is held to such close limits that there is minimum danger of getting varying results in production.

For full information about any of Sun's Rubber-Process Aids, call or write the nearest Sun Office.

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...these Pure Light Red Iron Oxides by Williams assure it!

They represent the ultimate in red iron oxide colors for the rubber industry.

Williams iron oxides come to you with all the benefits of our 72 years in the pigment business . . . and as a result of our experience in producing pure red iron oxides to specifications of the leading rubber companies.

Each is manufactured to rigid specifications for copper and manganese content, pH value, soluble salts, fineness, color, tint and strength by controlled processes and with special equipment. *The result is absolute uniformity of product.*

If you haven't already done so, try these finest of all iron oxide colors. Your own tests will show there is no equal for Williams experience.

LET WILLIAMS PUT THE MICROSCOPE ON *Your* COLOR PROBLEM

Whatever your color problem, bring it to Williams. Our 72-year experience can often save you time, money, and headaches in proper color formulation.

Address Dept. 8, C. K. Williams & Co., Easton, Pa.

IRON OXIDES • CHROMIUM OXIDES
EXTENDER PIGMENTS

WILLIAMS
COLORS & PIGMENTS

C. K. WILLIAMS & CO.
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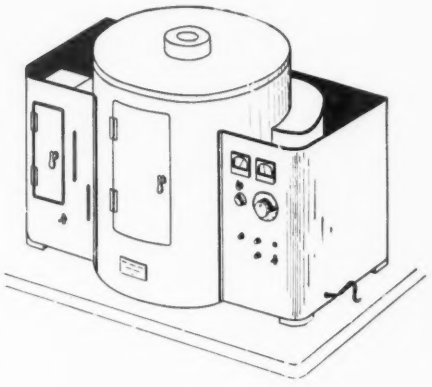
NEW EQUIPMENT

Ozonator for Testing of Rubber

A new ozonator which generates and maintains a continuous flow of ozone through a specimen exposure chamber under controlled conditions of pressure, temperature and flow rate has been developed by the G. F. Bush Associates, Box 175, Princeton, N. J. Called the GFB-LGL Ozonator, its particular uses

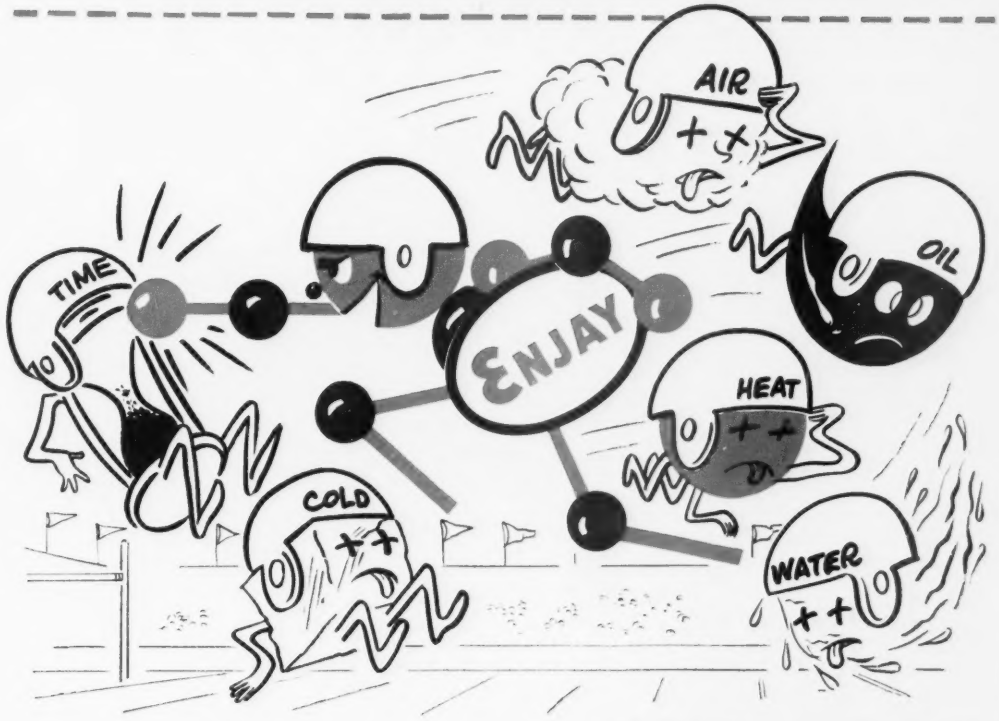


include ASTM tests and those by which an estimate is made of the relative resistance of rubber and rubberlike materials to cracking when they are exposed to air containing a very small, but precisely controlled, concentration of ozone.

Controls of the unit include the following: Temperature to 150° ± 1° F.; flow rate of 0 to 5 cubic meters per hour ±2%; concentration of 0 to 30±2 parts ozone in one hundred million parts of air. Design features include: Non-corrosive material, such as aluminum, in the zone circuit; non-leaking, low-pressure system; table model for compact, easy-to-reach operation; minimum temperature variation when specimens are inserted or removed; uniform temperature and ozone distribution in the specimen chamber; rotating rack to facilitate specimen handling; insulated exposure chamber; rear panel illumination of instruments, and quiet operation assured by electric flow meter.

In operation, the specimens are inserted through the door of the exposure chamber and supported on the rotating rack. The ozonized air, which is generated from preheated filtered air in the unit, passes into the exposure chamber through a false floor which provides uniform ozone and temperature distribution. The discharge from the top of the exposure chamber may be through a filter that removes the ozone or into a hood or outdoor connection. The concentration in the exposure chamber is occasionally checked by a chemical analysis, partial equipment for which is supplied with the unit, this equipment including especially constructed glassware, platinum electrodes, and a light-tight box.

PARACRIL beats 'em all...



VERSATILE PARACRIL—the buna N-type rubber marketed by Enjay Company really scores with its *inherent resistance* to OIL, AIR, WATER, HEAT, COLD, AND TIME. It is ideal for flexible parts subject to heavy abrasive wear, extremes of hot and cold, and destructive action of oils and fats.

WRITE OR CALL TODAY. Every Enjay office has competent, trained technicians ready, willing, and happy to help you adapt Paracril to solve your problem.

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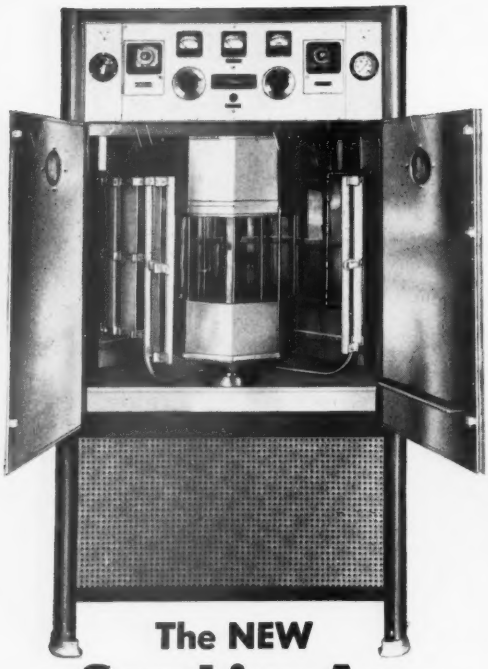


The NEW
Sunshine Arc Weather-Ometer
Type XW

A modernized and redesigned version of the open flame X-1 and X-1-A Weathering Units

Many of the control features that have proven their dependability in the Atlas Twin Arc Weather-Ometer have been combined with some features of the original X-1-A weathering unit to make a new Weather-Ometer of advanced design.

In the Type XW a new means of maintaining constant temperature is provided. Far more accurate temperature control is now available.

Radiation is from a Sunshine Carbon Arc which is of the motor-driven, open-flame type. Natural sunlight or intensified ultra-violet radiation is available depending upon the type of carbons and filters used. The light source has been improved to provide 16 hours of continuous operation as well as a number of other added conveniences.

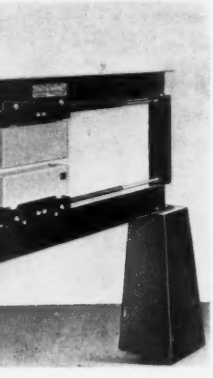
All instruments are located on a convenient control panel, including an arc voltage setting switch and meter, cycle control of light and water spray, 1 to 24 hour shut-down time switch, thermo-regulator and running time meter.

Type XW is fully automatic and may safely be left in unattended operation overnight. If deionized water is to be used, aluminum spray piping can be furnished. The capacity of the stainless steel lined testing chamber is 54 panels. The machine is sturdily constructed and is shipped assembled, ready for connection.

ATLAS ELECTRIC DEVICES COMPANY
361 West Superior St., Chicago 10, Ill.
FADE-OMETERS • LAUNDER-OMETERS • WEATHER-OMETERS

Traverse Mounting for Beta Ray Gage

The Pratt & Whitney Division of Niles-Bement-Pond Co., Hartford, Conn., has made available a traverse mounting for its Beta Ray Continuous Mill Gage, previously described in these columns, which makes it possible to scan and gage the full width of continuous strip material. The new mounting is expected to prove of particular value in controlling the edge-to-edge uniformity of sheet rubber, plastic, paper, asbestos, cloth, metal and other compositions. The rate of scanning is from 18" to 30" per minute and the operation is completely automatic. Limit stops are set on the rail of the traverse mounting so that when the Beta Ray gaging heads reach the edge of the strip material they automatically reverse and scan in the opposite direction. This permits a complete cross-sectional and longitudinal analysis of the material being processed. Recorders are available for use with the gage, and process control or alarm signal circuits may be incorporated in the installation if desired. The Beta Ray Gage uses radioactive isotopes from the atomic pile for measuring thickness deviations in continuous strip material.



SEE PAGE 132

"by HADLEY'S"

means **TOP** *quality*
TOP *performance*
with **LOWER** *production costs*

HAB-U-CO
RESIN EMULSIONS

they EXTEND and TACKIFY
all TYPES of LIQUID LATICES
SYNTHETIC or NATURAL (LATEX)
(G. R. S.-NEOPRENE-NATURAL)

A PROVEN PRODUCT MANUFACTURED UNDER CLOSE LABORATORY CONTROL

as EXTENDERS . . .

they are used to replace a high percentage of the rubber content in Latex Cements, thus lowering costs.

as TACKIFIERS . . .

they are used to modify the degree of tackiness desired in the dry cement film.

HAB-U-CO Resin Emulsions are light in color thus precluding any undue staining or discoloration of cemented surfaces.

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HADLEY BROS.-UHL CO.
514 CALVARY AVENUE • ST. LOUIS 15, MO.

Largest Conveyor Belt Press in the World
35' by 9'—total pressure 7800 tons
G. Siempelkamp & Co., Maschinenfabrik, Krefeld, (Germany)

OUTSTANDING
for RUBBER
Natural or Synthetic
COLUMBIAN CHEMICALS
MAPICO
RED 297
Strong Color on the Orange Side
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Still Deeper Mass Tone — Bluer Cast
IRON OXIDES OF EXCEPTIONAL PURITY

For wide variety of uses, high quality and uniformity these clean, bright reds are stand-outs. New, highly modernized plant and equipment and precise production controls have made them better than ever. Note these desirable characteristics.

- Clean bright color and tint
- Easy dispersion and processing
- Color permanence
- Exceptional strength
- Unusual purity
- Fine particle size
- Good aging behavior
- Moderate reinforcement
- Spheroidal particle shape
- Tear and flex resistance

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- High quality innertubes
- Footwear
- Rubber hose
- Drug items
- Sundries
- Chemical goods

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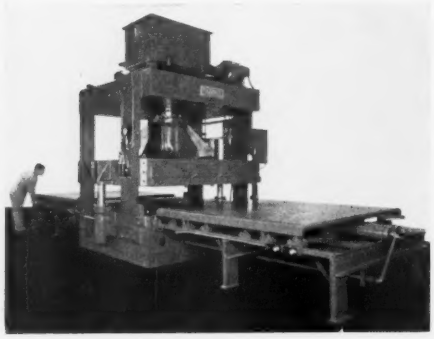
NEW EQUIPMENT (CONT'D)

F-B Auto Mat Trimming Press

Designed for increased efficiency in trimming automobile mats of the currently used larger sizes, the Auto Mat Trimming Press manufactured by the Farrel-Birmingham Co., Inc., Ansonia, Conn., has a capacity of 125 tons. This 84 by 96-inch hydraulic press has tables



which operate on anti-friction bearing rollers and are surfaced with ground, hardened steel plates. Adjustable deceleration of table movement is said to insure smooth, controlled action.

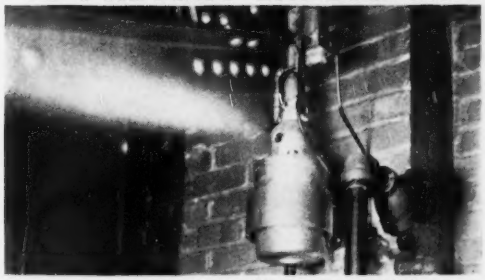
The automatic cyclical motion of the press platen and the two tables provides time for removal and placement of stock on one table while stock on the other table enters the press, is trimmed and withdrawn. Press and tables are hydraulically operated by separate, electrically-driven pumping units which, with the oil tank, are mounted on the top crosshead. Inching motion of any one unit is obtained by a selector switch.

The reciprocating cylinder has radial ribs extending over the platen area to provide reinforcement against deflections. The upright supports are steel slabs, and other heavy parts of the press, including the ground and polished 18-inch diameter ram, are of cast Mechanite steel. Other design features include an arrangement for quickly changing the knife setup, outside packing of all rams, adjustable guides on the moving platen, and safety controls to stop all motion.

Tinius Olsen Distortion Tester

Five complete units are incorporated in the new Heat Distortion Tester announced by the Tinius Olsen Testing Machine Co., 1088 Easton Road, Willow-Grove, Penna. Each of the five units operates independently of the others and may easily be removed. Each will accommodate all specimens from ⅛ by ½-inch to ½ by ½-inch under fiber stress of 66 psi or 264 psi. A separate automatic deformation indicator, thermometer, pilot light, automatic heating control and cooling system is provided for each unit. Temperature is raised 2° C. per minute from 25° C. to 200° C. This new testing machine, which meets ASTM Spec. D-648, is so designed that the specimen may be conveniently and quickly inserted in the test unit which is held in place by positive spring action.

an easy way to PREVENT EXPLOSIONS



Armstrong Controlled *Steam* Humidification

ARMSTRONG air-controlled Steam Humidifiers are worth their weight in gold wherever explosive vapors are present. By adding steam directly to the air, these units automatically maintain the relative humidity necessary to dispel any chance of a static electricity spark.

Simple, wholly dependable and economical, Armstrong Steam Humidifiers have been thoroughly tested and proven in rubber cement house applications. Humidifiers can be shipped from stock, ready for easy installation. GUARANTEED TO SATISFY or your money back.

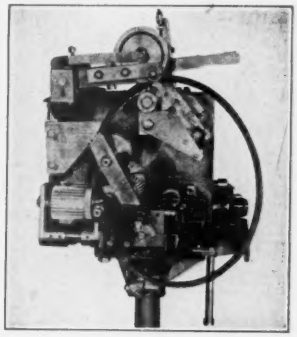
for full details on

Positive Protection Against Static Explosion Hazard

Send for this bulletin — 12-page bulletin 1772 gives complete information and prices.

ARMSTRONG MACHINE WORKS
822 Maple Street • Three Rivers, Mich.

Utility Crimper Type Flipper *for* Truck and Large Balloon Tires



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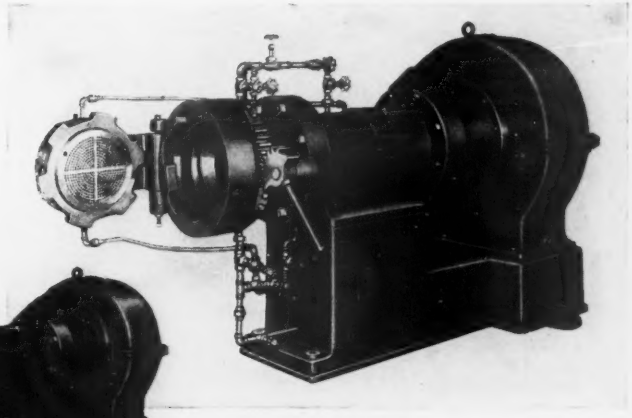
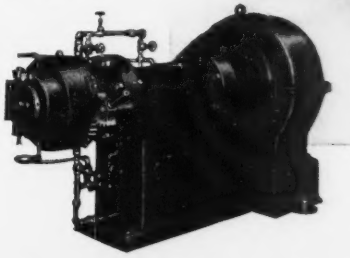
Long Distance Phone Call
MILWAUKEE—SHERIDAN 4-7020

6" Strainer

WITH SLABBING HEAD

Here is just another of the many examples of National-Erie design . . . the result of nearly a half century in engineering and producing machines for rubber and plastics working. Mechanical features are incorporated in NE strainers which have always resulted in year in year out operation at lowest cost. Let us consult with you on your rubber or plastics machine needs.





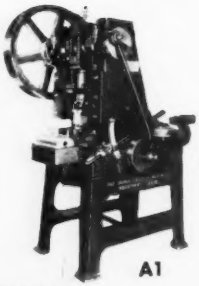
ABOVE: 6" strainer with combination slabbing head in open position.

LEFT: 6" strainer with combination slabbing head in closed position.

Complete Rubber and Plastics Working Machinery

NATIONAL ERIE CORPORATION
ERIE, PENNSYLVANIA • U. S. A.

For MORE than Half a Century the name COULTER has meant MORE in higher quality cuttings . . . MORE IN GREATER PRODUCTION. So much MORE that . . .

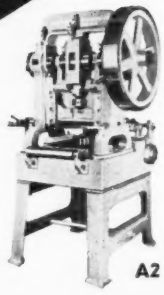


A1

Men who Know PRODUCTION MACHINES Choose

the James COULTER Machine Co.
BRIDGEPORT, CONN.

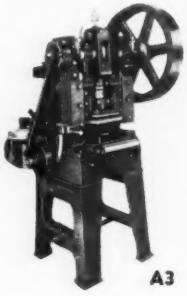
MODEL A-1
Cutting Heels at high speed production or short runs.



A2

MODEL A-2
Cutting Multiple Heels, Half and Full Soles with stock grain.

MODEL A-3
Cutting Multiple Heels and Taps with or across stock grain.



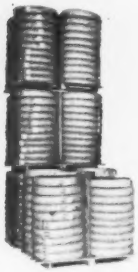
A3

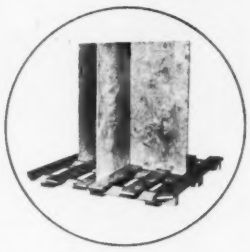
MODEL A-2s
(Not illustrated)
Cutting across grain of stock.

COULTER PRODUCTION MACHINES SINCE 1896

Heco Partitioned Pallet and Spacer

Materials subject to damage or compression by weight can now be handled on the Heco Partitioned Pallet and Spacer developed by the Hamerslag Equipment Co., 7 Front St., San Francisco 11, Calif. In the assembly of

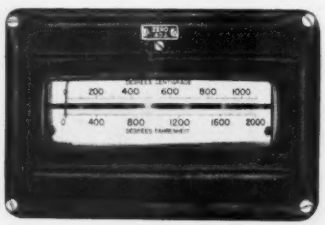




the pallet, two plywood panels are slotted centrally halfway down to permit them to be inter-locked and placed in right angle relation to each other. Angle-iron clips are used to hold the plywood sections in place and to give support. The pallet may be divided into as many partitions as necessary depending on the size and shape of the merchandise. The plywood used is extremely strong and can support a load up to 6,000 pounds. The Heco Spacer when not in use can easily be disassembled and stored flat on top of the pallet. The Heco Partitioned Pallet can be used by itself like a conventional pallet, when there is no need for tiering. The device is particularly suited for handling and storing tires, batteries, cartons, etc.

Wheelco Pyrometer Model 192

Designed for those applications where size of the heating equipment or space limitations demand the use of a smaller instrument, the Model 192 Indicating Pyrometer developed by the Wheelco Instruments Co., Chicago 7, Ill., may be either flush or surface mounted.



It is built to specifications similar to the larger pyrometers. The high resistance "edgewise" movement with Alnico V magnet and wide open mirrored scale is fully compensating and enclosed in a dustproof housing. The Model 192 with front dimensions of 7½ inches wide and 5 inches high is especially suited for use with smaller type heating equipment such as laboratory furnaces. The unit weighs 3½ pounds and has a 4¾-inch scale.

HOSE WIRE

JOHNSON high tensile hose reinforcement wire for braided type reinforcement . . . . . High fatigue vacuum hose reinforcement wire, **Johnson** bronze plate or liquor finish. Galvanized wire for field telephone (U.S. Army specifications) . . . Music wire . . . High carbon specialty wires.

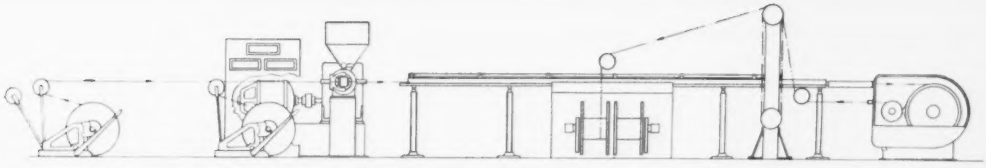
JOHNSON
STEEL & WIRE COMPANY, INC.
Worcester 1, Massachusetts

RANDALL & STICKNEY
Hand Grip Rubber Gauge No. 3-B

Height .....9"	Length .....9¾"	Range .....½"
Depth of Throat ....6½"	Dia. 50 Divisions Each Div. 1/1000"	Weight ....4 lbs. Frame Aluminum

Designed for gauging stock as it is coming from the calender.

FRANK E. RANDALL CO., Waltham 54, Mass.



DAVIS-STANDARD THERMO-PLASTIC WIRE INSULATING EQUIPMENT

COMPLETE EQUIPMENT FOR PLASTIC WIRE INSULATING

A complete line of rubber and plastics extruders

THE STANDARD MACHINERY COMPANY, MYSTIC, CONN., U. S. A.

Established in 1848 — *Incorporated in 1875*

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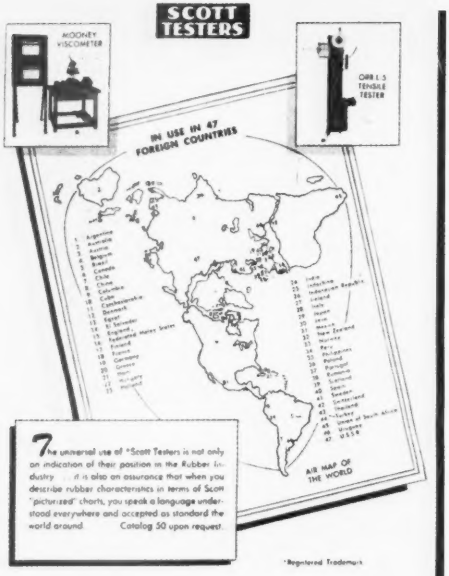
Drexel Bldg. Philadelphia 6.	Williams & Wilson, Ltd. Montreal, Toronto	Grant Engineering Co.	W. H. Del Mar Co. 5140 Crenshaw Blvd. Los Angeles

TESTED IS TRUSTED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MOONEY VISCOMETER
ORR L.S TENSILE TESTER
IN USE IN 47 FOREIGN COUNTRIES
AIR MAP OF THE WORLD
The universal use of *Scott Testers is not only an indication of their position in the Rubber industry . . . it is also an assurance that when you describe rubber characteristics in terms of Scott "pictorized" charts, you speak a language understood everywhere and accepted as standard the world around. Catalog 50 upon request.
*Registered Trademark

SCOTT TESTERS, INC. 57 BLACKSTONE STREET, PROVIDENCE, R. I.

The above advertisement appeared in "Rubber Age" September 1950 issue.

AT two recent international meetings—AMERICAN CHEMICAL SOCIETY RUBBER CONFERENCE and the INTERNATIONAL STANDARDS ORGANIZATION—constant reference was made to *SCOTT TESTERS in the various papers and discussions. This testifies to the universal use of Scott Testers, which makes their terms and values a common language derived from world-wide familiarity with the equipment and its purposes.

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SCOTT TESTERS, INC. 85 Blackstone St. Providence, R. I.

Standard of the World

REVIEWS

BOOKS

A Manual of Plastics and Resins (in Encyclopedia Form). Edited by William Schack. Published by the Chemical Publishing Co., 26 Court St., Brooklyn 2, N. Y. 6 x 9 in. 548 pp. $10.00.

As indicated by its title, this is a manual of plastics and resins prepared in encyclopedia form. The book is to be used as a dictionary, with every subject listed in alphabetical order, whether it is the name of a material, a chemical, a process, a molding definition, or an end-use field. Locating any particular subject has been made easy for the user by an elaborate cross referencing system designed to cover synonyms, possible alternative titles, and the common trade names of materials. A number of full-length articles are included, contributed by outstanding leaders in the field, and in addition there are hundreds of short articles on products and definitions of basic molding, fabricating and chemical terms. Three appendixes are included, the first briefly defining trade names and indicating manufacturers, the second containing fabrication data for certain materials, and the third composed of charts showing comparative prices and properties of the various plastics. The list of trade names was compiled by Arthur M. Merrill, associate editor of *India Rubber World*.

•

Small Plant Management. Edited by Dr. Edward H. Hempel. Published by The McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 18, N. Y. 6 x 9 in. 548 pp. $6.00.

Prepared under the auspices of the Management Division of the American Society of Mechanical Engineers, this book is a guide to modern on-the-job management techniques. It shows how small plants fit into the economic picture, how they are set up and operated, and the over-all opportunities for small plants both in the United States and abroad. The book represents the knowledge of the editor, who is chairman of the A.S.M.E. Small Plant Committee, and 20 contributing editors, each a nationally-recognized authority in his respective field. The many functions that aid in the establishment of efficient and profitable management are analyzed carefully and thoroughly. It is divided into four parts, as follows: (1) Small Plants as Economic Factors; (2) Management Tasks; (3) How to Solve the Important Problems of Small Plant Management; (4) Small Plant Future. A comprehensive subject index is included.

•

Industrial Chemicals. By W. L. Faith, D. B. Keyes, and R. L. Clark. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 6 x 9 in. 652 pp. $8.00.

Designed to end the time-consuming job of finding data on the production and use of commercial chemicals, this book contains concise coverage of the essential technical and economic data for 106 of such chemicals. Dealing with each chemical separately, from acetaldehyde to xylene, information is supplied on the latest manufacturing processes, equations for principal reactions and average yield expectations, raw material requirements, and a generalized use pattern. In a thorough presentation of the economic aspects of producing these chemicals, the authors discuss competitive processes and products, recent trends in sales, and plant size and cost. Price and production charts, as well as maps locating the major manufacturing plants in the United States, are included in the book. A comprehensive subject index is also included.

THE SMACO GASKET SPLICER

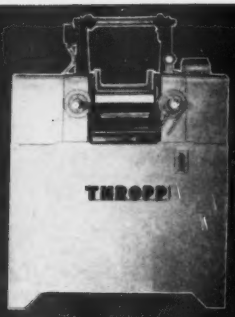
SPLICER
VULCANIZER
EMBOSSER
MOLDER

Features

- SPEED
- NO BREAKDOWNS
- HEAT CONTROLS IN BOTH BRONZE PLATENS
- ONE OPERATOR — FROM 1 TO 8 UNITS
- LONG LIFE HEATERS AND THERMOSTATS

Ask ABOUT OUR HAND RUBBER CUTTER

For Further Information . . . . Write to
SIVON MACHINE & MFG. CO.
PAINESVILLE, OHIO



NEW LABORATORY MILL

6" x 12" with Anti-Friction Bearings

THE laboratory mill illustrated above was expressly designed as a precision mill for operation at high temperature (650° F).

A self contained lubrication system circulates oil through the roll journal bearings. The use of piston ring type oil seals eliminates oil leaks and the frequent replacement of rubber-based oil seals. Write for specification folder.

Capacity of mill: 2 to 3 pounds
Space required: 28" wide, 60" long.

- *West Coast Rep.:* H. M. Royal, Inc., 4814 Loma Vista Ave., Los Angeles, Cal.
- *Export Agent:* Steinhardter & Nordlinger, 105 Hudson St., N. Y.

THROPP
WM. R. THROPP & SONS CO. Trenton, N. J.

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THE RUBBER INDUSTRY owes its development largely to scientific and technical research and the Institution was founded in 1921 to foster scientific and technical advancement and to disseminate the results.

THE INSTITUTION TODAY is the centre of a great fraternity of rubber manufacturers, scientists, technologists, research establishments, executives and students from every country whose object is the advancement of the cause of the rubber industry throughout the world.

OBJECTS: To promote corporate and concerted effort in the industry by bringing together all those engaged or interested in the various branches of science and technology on which the Industry is based and co-ordinating their respective contributions.

To promote the profession and practice of Rubber Technology.

To encourage the extension of scientific and technical education in the principles and details of rubber manufacture.

To maintain a scheme of Diplomas for the recognition of efficiency in knowledge of all branches of technology essential to the successful maintenance and development of rubber manufacture.

To arrange for the holding of meetings, the reading of papers and the giving of lectures with subsequent discussions and publication.

To foster the systematic study of scientific and technical problems involved in the various phases of the manufacture of natural and synthetic rubbers and rubber-like materials and their conversion into finished products.

To encourage original work and research dealing with the manufacture of rubbers.

PUBLICATIONS.

The Transactions: Bi-monthly record of scientific and technological investigations in the realm of rubber and its allied industries.

Annual Report on the Progress of Rubber Technology: containing systematic accounts of the developments in rubber technology from year to year.

Proceedings of Rubber Technology Conferences.

INVITATION TO MEMBERSHIP.

At this time of progress and expansion in the affairs of the Institution, its Council, conscious of the benefits that lie within the sphere of the Institution, invites applications for the privilege of membership from those engaged or interested in the Rubber and its allied industries.

Application forms and full particulars may be obtained from:—

THE REGISTRAR
INSTITUTION OF THE RUBBER INDUSTRY
12, WHITEHALL
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REVIEWS (CONT'D)

Condensed Chemical Dictionary. (4th Edition). Published by the Reinhold Publishing Corp., 330 West 42nd St., New York 18, N. Y. 6 x 9 in. 726 pp. $10.00.

Completely revised and enlarged by Professor and Mrs. Arthur Rose of State College, Penna., the latest edition of this internationally-known reference book is more complete than ever. It is the latest and most up-to-date dictionary of chemistry, raw materials, trade names and processes, covering all recent developments on chemicals and related materials, and containing some 23,000 separate entries. The new edition, for the first time, includes hundreds of definitions of common chemical terms. As usual, where possible, data is included on standard containers, hazards, and shipping regulations. Many new items have been added in such fields as nuclear chemistry, chemotherapy, and petrochemistry. Many new cross references have been added to assist the reader in quickly locating desired information. The book is a "must" for all technical libraries.

BOOKLETS, CATALOGS, etc.

Cost-Cutting Idea Book for 1950. (8th Edition). Modern Industry, 40 Madison Avenue, New York 17, N. Y. 5½ x 8 in. 64 pp.

This latest in the series of Modern Industry Cost-Cutting Idea Books is devoted to spotlighting ideas, methods, techniques and equipment that can be put to work to cut costs, increase productivity, and to improve the competitive position of a company. Data contained in the book has been gathered by editors of "Modern Industry," and represent practical, tested ideas and techniques now in use by plants throughout the country. All phases of industry activity are covered from materials handling to packaging to cost accounting and manpower problems. The booklet also presents a useful Management Checkup Chart containing typical, pertinent questions relative to the conduct of a successful business. Illustrations and tabular matter enhance the value of this attractive booklet.

•

Monsanto Plasticizers in Polyvinyl Chloride Film and Sheeting. (Technical Bulletin No. 0-70). Organic Chemicals Division Monsanto Chemical Co., St. Louis 4, Mo. 8½ x 11 in. 16 pp.

The properties and uses of typical polyvinyl chloride film and sheeting formulations are described in this technical bulletin. Pointing out that plasticizers are as important to the quality of the finished product as the resin itself, the bulletin contains detailed information on various types of plasticizers and their functions. The composition and relative values of seven stabilizer systems are also included. Although nine of the plasticizers suggested are from the company's diversified line of vinyl plasticizers, the bulletin recommends other plasticizers and stabilizers as well. It also includes a comprehensive list of suppliers of raw materials required in the recommended formulations.

•

Wheelco Data Book & Catalog. (Bulletin TC-8). Wheelco Instruments Co., 847 West Harrison St., Chicago 7, Ill. 8½ x 11 in. 42 pp.

Up-to-date prices, application recommendations and pertinent information concerning instrument sensing units and associated accessories are presented in this booklet. Among the many special items listed in the convenient table of contents are resistance bulbs and wells, special thermocouples for plastic injection and extrusion machines, and many other units. The large standard line of thermocouples, protecting tubes, lead wire, insulators, etc., is profusely illustrated. Complete descriptions and specifications are clearly indicated. Essential data pertaining to making, checking, selecting and ordering thermocouples; wire sizes and resistances and temperature-millivolt curves is given.

The RPAs. (Report No. 50-5). By Charles J. Mighton. Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Wilmington 98, Del. 6¼ x 9½ in. 24 pp.

The RPAs are chemical peptizers which accelerate the softening of rubber during mastication. This report reviews the physical and chemical properties of RPA No. 2, No. 3 and No. 5 and shows how they can be used effectively in both rubber and GR-S under varying conditions and in various types of equipment. The effects of remilling footwear stocks containing RPA and of storage on Mooney viscosity of GR-S plasticized with RPA are shown, with various comparisons made including the plasticizing effect of RPA No. 3 and No. 5 in GR-S-10, single breakdown GR-S containing RPA No. 5 with single and double breakdown GR-S, and plasticizing effect of RPA No. 2 and 3 of smoked sheets masticated in a laboratory Banbury. Special sections devoted to the use of the RPAs in cements and in the manufacture of reclaimed rubber are also included in the report.

•

Ty-Ply: The Rubber to Metal Vulcanizing Adhesive. Marbon Corporation, Gary, Indiana. 8½ x 11 in. 24 pp.

The latest information concerning the properties and uses of Ty-Ply, the well-known rubber-to-metal adhesive, is contained in this booklet. After explaining what the material is, what it does, and the different types available, the booklet contains detailed instructions on proper application. The adhesion of various rubber stocks to steel is dealt with extensively, the stocks including natural rubber, GR-S, Hycar, neoprene, and butyl rubber. In each instance a recommended formula is given with physicals indicated and type of break shown. A table of adhesions covering 18 different metals is also included. Typical applications for which Ty-Ply is currently being used are listed in the booklet.

•

Johnson Electrap for Pumping Service, Lifting Service and Vacuum Service. (Bulletin ET.) Johnson Corp., Three Rivers, Mich. 8½ x 11 in. 4 pp.

The working mechanisms of the Electrap, an electrically-operated trap for pumping or lifting service or for draining vacuum lines, are described in this bulletin. Operations are described and drawings of typical installations offered. The bulletin also tells how the unit is being used to return condensate from high pressure processing equipment back to the boiler room at higher temperatures by eliminating the heat losses that come with flashing or the addition of cooling water.

SEE PAGE 132

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REVIEWS (CONT'D)

Metron Miniature Fixed Ratio Speed Changers. (Bulletin No. 100). Metron Instrument Co., 432 Lincoln St., Denver 9, Colorado. 8½ x 11 in. 4 pp.

The company's line of miniature speed changers are described and illustrated in this bulletin. Three series are described, the first for ordinary gearing applications, where rotational accuracy, backlash, and smooth running are not important factors; the second for precision gearing applications where rotational accuracy, low losses, and smoothness of running are important, and the third for applications requiring zero backlash, where low losses and smoothness of running are secondary considerations.

•

Arcco Tackifier Resin Emulsions for Natural and Neoprene Rubber Latices. (Technical Data Sheet No. A-39). American Resinous Chemicals Corp., 103 Foster St., Peabody, Mass. 8½ x 11 in. 4 pp.

As indicated by the title, this technical bulletin is devoted to the various resin emulsions made by the company for use in natural rubber and neoprene latices. Methods of blending are outlined and a section is devoted to the compounding and handling of tackifier-latex adhesives. Specifications for each of the tackifiers listed and discussed are included.

•

A Simplified Guide to Bakelite and Vinylite Plastics and Resins. Bakelite Division, Union Carbide & Carbon Corp., 30 East 42nd St., New York 17, N. Y. 8½ x 11 in. 24 pp.

The various forms of Bakelite phenolic, styrene, polyethylene and Vinylite plastics and resins are presented in this booklet under fourteen major headings. It describes in simple terms the general characteristics and properties of each form and gives typical applications. Examples of many of the different forms are shown in the 126 photographs contained in the booklet.

•

Metallizing. Metalweld, Inc., 26th and Hunting Park Ave., Philadelphia 29, Penna. 8½ x 11 in. 4 pp.

This bulletin describes the company's metallizing process for making mechanical repairs and protecting surfaces against corrosion and contamination. Metals used in the process include various carbon steels, stainless steel, bronze, copper, nickel, zinc, aluminum, etc. The bulletin is profusely illustrated with pictures with lengthy descriptive captions.

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SEE PAGE 132

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This new hydrocarbon plasticizer *completely* replaces dibutyl phthalate in nitrile rubbers — produces soft vulcanizates having high tensile, excellent elongation, and very low modulus. **PANAFLEX BN-1** plasticized stocks possess good ageing properties, superior electrical characteristics, and show good gasoline and oil resistance.

SPECIFY GRAVITY	0.9440
COLOR, NPA	1½
REFRACTIVE INDEX	1.553
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ODOR	Excellent
VISCOSITY, SSU @ 100°F	240

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Pan American Refining Corp

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MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

Natural Rubber

Since our last report (October 5), the price of natural rubber has soared to new record prices in the Singapore market at Straits $2.17 a pound on November 7. On the New York Commodity Exchange, the price of spot rubber hit a low of 58.00 cents on October 6, and a high of 86.00 cents on November 2, a differential of 28 cents. The average price of spot rubber for October was 62.19 cents based on 21 trading days. This compares with an average of 55.98 in September.

With the price of natural rubber at the highest levels in 23 years, the board of governors of the Commodity Exchange on November 9 set new daily price fluctuation limits for trading in futures contracts and also raised the margin requirements.

The flexible margin requirement adopted by the Exchange on September 9 began with $750 a contract when the market price of rubber was under 20 cents a pound, and ran up to $5,000 a contract when the price was between 65 and 69.99 a pound. Four new margins based on rubber prices ranging up to 85 cents a pound and higher were set on November 9. When the price is 70 to 74.99 cents a pound, the margin requirement is $6,500 a contract, and when the market is 85 cents a pound or higher, the margin is fixed at $9,500 a contract.

Today's quotations on the outside market, London and Singapore follow:

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.85
November	.84½
December	.83
Thin Latex Crepe:	
Spot	.88
November	.87½
Thin Brown Crepe, No. 2	.78
Ambers, No. 3	.78
Flat Bark Crepe	.71

London Market

(Standard Smoked Sheets)

December	81.96 - 82.54
January-March	77.87 - 78.46

Singapore Market

(Standard Smoked Sheets)

December	70.18 - 70.51

Synthetic Rubber

(Dry Types-Per Pound)

Butaprene NF	.440 - .450
Butaprene NL	.450 - .460
Butaprene NAA	.490 - .500
Butaprene NXM	.520 - .530
Chemigum 30 N4NS	.400 - .470
Chemigum 50N4NS	.400 - .470
Chemigum N3	.450 - .520
GR-I	—— - .185
GR-S	—— - .185
Hycar OR-25	.450 - .460
Hycar OR-15	.520 - .530
Hycar OS-10	.500 - .510
Neoprene Types CG and AC	—— - .500
Neoprene Type E	—— - .650
Neoprene Types FR and KNR	—— - .750
Neoprene Type GN	—— - .350
Neoprene Type GN-A	—— - .350
Neoprene Type RT	—— - .370
Neoprene Type S	—— - .350
Neoprene Type W	—— - .370
Paracril 18	.430 - .450
Paracril 26	.440 - .460
Paracril 35	.510 - .530
Silastic (compounded)	2.35 - 4.40
Thiokol Type A	.370 - .470
Thiokol Type FA	.520 - .620
Thiokol PR-1	.750 - .850
Thiokol Type ST	.750 - .850

NEW YORK, NOV. 9, 1950

Scrap Rubber

Sharp increases in the demand for scrap rubber and rising prices have resulted in a heavy outflow of the material. Many consumers overstocked, and as a result, scrap prices fell off slightly. Reclaimers were not accepting carload shipments of scrap, for a time, while trailer loads required special permits. This situation, however, seems to be at an end and the market for scrap continues at high levels. Current quotations follow:

Mixed passenger tires	ton	$22.50
Beadless truck tires	ton	nom.
Mixed truck tires	ton	nom.
Beadless passenger tires	ton	nom.
No. 1 passenger peelings	ton	60.00
No. 1 truck peelings	ton	60.00
Red passenger tubes	lb.	.14
Black passenger tubes	lb.	.10
Mixed tubes	lb.	.07
No. 2 truck tubes	lb.	nom.
Red truck tubes	lb.	.14
Black truck tubes	lb.	.10
Buffings	ton	25.00

Reclaimed Rubber

Consumption of reclaim for the month of September was estimated at 27,868 long tons by the Department of Commerce. This compares with the 26,151 long tons consumed in the previous month. The demand for reclaimed rubber continues at the high levels evidenced during the past few months. In view of the shortage of new rubber, both natural and synthetic, manufacturers are attempting to augment their supplies with quantities of reclaim. Current quotations follow:

Tires

Black, Digester (Natural)	lb.	.10½ - .11
Peels No. 1	lb.	.11 - .11½
Whole Tire (Blend)	lb.	.10 - .10½

Inner Tubes

Black (Natural)	lb.	.19 - .20½
Red (Natural)	lb.	.25 - .25½
Butyl	lb.	.11 - .11½

Cotton Tire Fabrics

Cotton supplies have become so tight that major manufacturers of cotton tire fabrics and chafers have temporarily withdrawn from the market. For some time, the market for cotton tire fabrics had been enjoying the highest levels seen for the past several years. However, available supplies of cotton have limited the production of chafers and fabrics, causing the present situation. Prices furnished herewith are for informational purposes only and represent the last quotations on a moving market:

Standard, Peeler, 12/4/2	lb.	.88
Standard, Peeler, 14/4/2	lb.	.90
Standard, Peeler, 16/4/3	lb.	.92½
Extra Staple, Peeler, 12/4/2	lb.	.94
Extra Staple, Peeler, 14/4/2	lb.	.96
Extra Staple, Peeler, 16/4/3	lb.	.99

Chafers

14.4 oz. (per sq. yard)	lb.	.83½
9.25 oz. (per sq. yard)	lb.	.80
11.65 oz. (per sq. yard)	lb.	.77
8.9 oz. (per sq. yard)	lb.	.81¼

Cotton

The market for middling uplands on the Cotton Exchange moved in a range of 3.75 cents since our last report (October 5), high for the period being 42.60 cents reached on November 9, and low being 38.85 cents reached on October 18. The average price of middling uplands for the month of October was 40.66 cents based on 25 trading days. This compares with an average of 41.62 cents in September.

A world cotton deficit of nearly two million bales this season was recently predicted by the International Cotton Advisory Committee. The Committee said that total United States exports might run from three million to slightly more than four million bales, depending on Government limitations.

The Department of Agriculture, in its semi-final report of the year, recently estimated this year's cotton crop at 9,945,000 bales of 500 pounds gross weight. This is 76,000 bales above the 9,869,000 bales forecast a month ago. It compares with 16,128,000 bales produced last year and 11,599,000 for the 1939-48 ten-year average.

Marketing quotas and acreage allotments will not be in effect for the 1950-51 season, and Secretary of Agriculture Charles Brannan has indicated that a production of 16,000,000 bales is needed to take care of increased domestic and export demands and to maintain minimum reserves.

Quotations for middling uplands on the Exchange follow:

	Oct. 5	November 9		
	Close	High	Low	Close
Dec.	40.90	42.42	41.50	41.69
Mar.	40.64	42.44	41.40	41.40
May	39.40	42.10	41.00	41.00

Closing Rubber Prices on New York Commodity Exchange (No. 1 R.S.S. Contract)

FROM OCTOBER 6 TO NOVEMBER 9

Oct.	Spot	Dec.	Mar.	May	July	Sales
6	58.00	52.75	47.00	42.75	40.75	65
7						
8						
9	62.50	54.75	49.00	44.75	42.75	45
10	61.50	56.75	51.00	46.75	44.75	3
11	61.50	55.25	49.00	44.75	42.75	130
12						
13	64.00	57.25	51.00	46.75	44.75	146
14						
15						
16	65.00	59.25	52.50	47.50	45.50	227
17	63.00	57.25	50.20	45.50	43.50	175
18	61.00	55.25	48.35	43.50	41.50	50
19	63.00	57.25	50.35	45.50	43.50	80
20	63.50	59.25	52.35	47.50	45.50	84
21						
22						
23	63.50	59.75	53.50	48.50	46.50	51
24	63.50	59.90	53.50	48.50	46.50	102
25	63.50	59.50	52.50	47.50	45.50	30
26	64.50	61.00	54.00	48.50	46.00	47
27	64.00	60.50	53.00	47.50	45.00	95
28						
29						
30	66.50	62.25	55.00	49.25	47.00	267
31	70.00	64.25	57.00	51.25	49.00	61
Nov.						
1	69.00	66.25	58.25	51.75	49.50	90
2	70.00	67.50	57.00	49.75	47.50	82
3	67.50	65.25	56.25	48.60	46.35	213
4						
5						
6	74.50	67.25	58.25	50.60	48.35	1
7						
8	86.00	69.25	60.25	52.60	50.35	35
9	85.00	73.25	64.25	52.60	54.35	65

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STATISTICS *Of Interest to the Rubber Industry*

U. S. Imports and Re-Exports of Natural Rubber

	GROSS IMPORTS										RE-EXPORTS		TOTAL NET IMPORTS
	Natural Rubber (Dry)			Natural Rubber (Latex)			Guayule						
Year	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Total Gross Imports Long Tons	Long Tons	Total Declared Value	Long Tons
1936	467,064	152,072,496	14.54	19,852	6,659,899	14.98	1,229	286,552	10.41	488,145	12,581	4,488,223	475,564
1937	574,600	237,307,041	18.44	23,185	10,213,670	19.67	2,694	745,873	12.36	600,479	7,902	3,385,433	592,577
1938	397,640	125,373,864	14.08	11,944	4,168,127	15.58	2,508	628,886	11.19	412,092	5,652	1,799,124	406,440
1939	469,946	167,586,780	15.92	27,437*	10,467,552	17.03	2,233	463,345	9.27	499,616	13,125	5,832,618	486,491
1940	781,202	303,308,823	17.33	33,789	14,593,466	19.28	3,633*	758,007	9.31	818,624	7,060	3,197,136	811,564
1941	989,498	401,976,317	18.14	34,797*	15,965,627	20.48	4,881	1,145,767	10.48	1,029,176	5,376	2,757,872	1,023,800
1942	266,276	112,537,426	18.87	10,646	5,630,667	23.61	5,523	1,660,792	13.42	282,445	10,856	5,913,386	271,589
1943	50,358	31,369,198	27.81	1,890	1,312,202	31.00	7,678*	3,636,789	21.14	59,926	22,583	16,446,707	37,343
1944	103,847	73,908,549	31.77	3,091	2,092,211	30.99	6,701*	3,351,233	22.33	113,639	9,739	8,712,695	103,900
1945	134,408	95,814,102	31.82	4,733	3,115,853	30.22	10,040	5,963,797	26.52	149,221	9,509	7,201,746	139,712
1946	366,415	222,552,939	27.12	8,421	5,843,085	29.14	5,344	2,859,246	23.89	380,180	7,711	5,331,954	372,469
1947	691,087	306,951,814	19.83	17,542	9,787,722	30.98	2,884	1,492,825	23.11	711,513	4,121	2,354,494	707,392
1948	702,293	290,849,177	18.49	32,745	9,820,080	24.93	302	71,330	10.53	735,340	6,672	3,259,324	728,668
1949	630,818	225,341,459	15.95	29,974	14,970,478	22.30	....	.....	....	660,792	6,253	2,746,109	654,539
1949:													
Jan.	**66,575**	**27,037,698**	**18.13**	**1,132**	**634,165**	**25.02**	....	.....	....	67,707	**757**	**320,036**	**66,950**
Feb.	**55,234**	**21,549,791**	**17.41**	**2,159**	**1,030,107**	**21.30**	....	.....	....	57,393	**434**	**211,323**	**56,959**
Mar.	**53,768**	**20,095,422**	**16.68**	**2,809**	**1,564,383**	**24.87**	....	.....	....	56,577	**562**	**245,780**	**56,015**
Apr.	**48,263**	**18,167,840**	**16.85**	**2,271**	**1,219,404**	**23.97**	....	.....	....	**50,533**	**315**	**165,632**	**50,218**
May	**51,243**	**18,827,018**	**16.40**	**2,191**	**1,105,887**	**22.54**	....	.....	....	**53,434**	**390**	**181,457**	**53,044**
June	49,038	18,084,566	16.47	2,180	1,113,169	22.80	....	.....	....	51,218	471	226,882	50,747
July	43,474	15,502,688	15.76	2,267	1,146,784	22.59	....	.....	....	45,741	699	289,896	45,042
Aug.	46,853	15,828,526	15.08	2,725	1,342,109	21.98	....	.....	....	49,578	251	110,368	49,327
Sept.	43,476	14,069,331	14.45	2,144	1,095,225	22.81	....	.....	....	45,620	556	248,921	45,064
Oct.	**44,651**	**14,678,475**	**14.66**	**2,634**	**1,213,360**	**20.57**	....	.....	....	**47,285**	**404**	**160,047**	**46,881**
Nov.	63,641	20,693,593	14.51	3,512	1,645,360	20.89	....	.....	....	67,153	11	9,002	67,142
Dec.	63,982	20,770,607	14.49	3,952	1,860,525	21.02	....	.....	....	67,394	689	295,362	67,245
1950:													
Jan.	54,277	17,881,882	14.71	3,974	1,951,793	21.92	....	.....	....	58,251	431	225,196	57,820
Feb.	50,022	17,373,658	15.51	3,336	1,608,163	21.52	..	.....	....	53,358	558	252,013	52,800
Mar.	57,831	21,120,732	16.30	3,650	1,826,747	22.34	..	.....	....	61,481	659	326,688	60,822
Apr.	72,418	27,412,444	16.89	4,395	2,199,149	22.34	175	47,117	12.02	76,988	639	340,781	76,349
May	56,804	21,822,118	17.15	3,183	1,904,513	26.71	200	58,948	13.16	60,187	597	289,551	59,590
June	73,806	31,525,162	19.07	3,965	2,294,358	25.83	105	33,651	14.31	77,876	625	322,008	76,451
July	53,245	27,256,854	20.11	4,225	2,710,430	28.64	70	26,836	17.11	57,540	683	381,650	56,857

Source: U. S. Department of Commerce. * Adjusted to agree with total gross imports.

Notes: (1) Figures for latex are on a dry weight basis. (2) Figures for re-exports include natural rubber (dry and latex) and guayule. (3) In the years 1940 through 1943, crepe sole rubber imports were reported under a separate classification. Such imports, which are included under natural rubber, dry above, were: 856,294 pounds, valued at $191,097 in 1940; 379,607 pounds, valued at $85,924 in 1941; 662,503 pounds, valued at $159,530 in 1942; and 21,653 pounds, valued at $5,215 in 1943.

Natural Rubber
(Including Latex and Guayule)

(All Quantities in Long Tons)

Year	New Supply	Consumption	Re-Exports	Stocks On Hand at End of Period
1936	**488,145**	**575,000**	**12,581**	**223,000**
1937	**600,479**	**543,600**	**7,902**	**262,204**
1938	**411,983**	**437,031**	**5,652**	**231,500**
1939	**499,473**	**592,000**	**13,125**	**125,800**
1940	**818,243**	**648,500**	**7,060**	**288,864**
1941	**1,029,007**	**775,000**	**5,376**	**533,344**
1942	**282,653**	**376,791**	**10,856**	**422,714**
1943	**55,329**	**317,634**	**20,815**	**139,594**
1944	**107,834**	**144,113**	**9,665**	**93,650**
1945	**135,672**	**105,429**	**6,743**	**118,715**
1946	**400,687**	**277,597**	**4,338**	**237,467**
1947	**688,354**	**562,661**	**4,101**	**129,038**
1948	**735,227**	**637,332**	**6,673**	**141,541**
1949	**660,792**	**574,522**	**6,253**	**106,619**
1949:				
Jan.	**67,706**	**50,188**	**757**	**125,050**
Feb.	**57,401**	**46,285**	**434**	**118,803**
Mar.	**56,577**	**53,108**	**562**	**117,664**
Apr.	50,533	47,859	315	112,916
May	53,510	46,128	390	111,875
June	51,218	47,117	471	103,626
July	46,277	40,597	699	103,017
Aug.	49,579	45,307	251	99,850
Sept.	45,620	43,978	556	100,618
Oct.	47,285	51,243	404	90,733
Nov.	67,152	52,093	701	99,208
Dec.	67,934	52,919	713	106,619
1950:				
Jan.	58,251	59,992	431	108,769
Feb.	53,393	56,580	558	104,477
Mar.	61,481	60,859	659	101,691
Apr.	76,998	57,914	639	106,124
May	60,699	63,813	597	100,776
June	77,876	63,333	625	99,457
July	61,660	61,402	683	93,653
Aug.	72,248	63,852	600	87,135

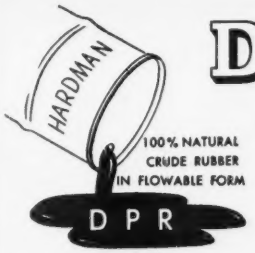
Source: 1936-40, U. S. Department of Commerce; 1941 to date, Rubber Division, OMD, and Predecessor Agencies.

U.S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.

(All Quantities in Long Tons)

	Balata		Jelutong		Gutta-Percha & Other Guttas	
Year	Tons	Value	Tons	Value	Tons	Value
1936	535	199,368	6,163	1,296,364	1,568	555,643
1937	354	151,344	7,109	2,017,786	1,122	440,894
1938	509	181,140	9,132	2,944,504	444	204,582
1939	694	265,553	6,640	1,603,418	1,740	539,255
1940	648	300,500	7,451	2,449,137	2,340	1,004,885
1941	924	489,514	8,821	2,954,001	1,783	607,025
1942	1,544	1,107,059	1,200	530,296	804	525,763
1943	1,047	708,701	35	14,840	....	.....
1944	1,012	660,805	86	45,578	10	4,999
1945	1,361	907,253	....	.....	36	21,970
1946	2,281	2,233,065	304	256,169	423	458,064
1947	1,982	2,276,531	2,878	1,496,887	392	779,591
1948	1,195	805,078	3,401	2,377,765	423	542,788
1949	1,391	814,554	1,043	834,978	197	189,021
1949:						
Jan.	46	29,922	91	93,738	19	11,934
Feb.	65	53,665	77	91,362	9	16,328
Mar.	136	86,499	60	52,313	5	30,967
Apr.	88	48,244	14	8,753	16	9,878
May	103	60,361	85	83,391	..	.....
June	44	20,821	74	47,515	27	16,292
July	164	78,112	46	37,403	5	3,391
Aug.	137	66,002	114	96,509	5	2,218
Sept.	208	122,732	91	74,605	22	31,672
Oct.	222	142,538	123	92,681	19	15,221
Nov.	77	68,678	160	89,806	34	28,559
Dec.	54	36,980	108	67,002	39	24,061
1950:						
Jan.	61	42,855	37	18,308	56	35,288
Feb.	42	24,040	162	123,570	30	20,291
Mar.	90	66,374	113	97,008	17	13,672
Apr.	68	45,844	246	211,744	30	23,369
May	78	50,093	114	103,796	69	86,151
June	143	74,936	120	104,123	49	112,902
July	109	53,480	118	101,258	64	87,284

Source: U. S. Department of Commerce.



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Synthetic Rubber—Totals

(GR-S, Neoprene, Butyl, and Buna N Types)

(All Quantities in Long Tons)

Year	Production	Imports	Consumption	Exports	Stocks On Hand at End of Period
1941	8,383	.....	6,259	572	1,702
1942	22,434	.....	17,651	1,419	4,612
1943	231,722	.....	170,891	18,148	41,568
1944	762,630	11,043	566,670	104,266	142,927
1945	820,373	10,407	693,580	83,778	203,454
1946	740,026	7,709	761,699[a]	72,920	114,963
1947	508,702	1,093	559,566	11,385	62,366
1948	488,343	15,671	442,072	4,874	115,111
1949	393,690	17,242	390,855	6,483	98,042
1949:					
Dec.	27,234	1,578	32,277	352	98,205
1950:					
Jan.	22,178	1,659	33,966	546	92,284
Feb.	29,336	2,035	31,860	577	88,381
Mar.	33,003	2,569	36,647	621	86,824
Apr.	34,821	2,302	38,075	711	83,440
May	37,320	2,762	43,366	620	74,524
June	38,569	2,433	46,011	622	65,346
July	43,820	2,239	43,687	707	67,085
Aug.	44,671	2,618	49,569	625	62,083

Source: Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures shown include the output of both government and privately-owned plants. (3) Figures for 1941 are estimated. [a] Includes year-end adjustment of 5,384 tons to cover non-reporting companies.

Synthetic Rubber—By Type

(All Quantities in Long Tons)

New Supply

	GR-S (Buna S)	GR-M (Neoprene)	GR-I (Butyl)	Buna N Types	Total
1942	3,721	8,956	23	9,734	22,434
1943	182,259	33,603	1,373	14,487	231,722
1944	679,949	56,660	20,252	16,812	773,673
1945	724,859	45,672	52,378	7,871	830,780
1946	613,408	47,766	80,823	5,738	747,735
1947	408,858	31,495	62,824	6,618	509,795
1948	405,492	34,848	56,662	7,012	504,014
1949	310,599	35,215	54,046	11,072	410,932

Consumption

1942	2,579	6,833	22	8,217	17,651
1943	131,977	26,205	304	12,405	170,891
1944	495,552	46,243	10,763	14,112	566,670
1945	600,145	42,394	43,012	8,029	693,580
1946	632,126	44,357	79,228	5,988	761,699
1947	448,589	37,703	68,838	4,536	559,666
1948	345,313	32,118	58,870	5,771	442,072
1949	299,420	31,753	50,855	8,827	390,855

Exports

1942	222	1,037	..	160	1,419
1943	14,937	2,540	40	631	18,148
1944	98,380	4,799	530	557	104,266
1945	76,555	5,837	980	406	83,778
1946	68,763	2,642	495	797	72,697
1947	7,951	2,617	62	755	11,385
1948	1,093	2,875	21	885	4,874
1949	1,401	3,330	178	1,574	6,483

Stocks at End of Period

1942	1,050	1,786	4	1,772	4,612
1943	30,975	6,415	1,033	3,145	41,568
1944	116,130	11,739	9,892	5,166	142,927
1945	170,571	9,703	18,378	4,802	203,454
1946	81,483	10,470	19,478	3,755	115,186
1947	40,606	5,237	13,184	3,339	62,366
1948	96,282	5,072	10,995	2,762	115,111
1949	77,731	4,654	12,224	3,433	98,042

Source: Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures for GR-M and Buna N Types include production of privately-owned plants.

Gasoline Consumption

(In Thousands of Barrels of 42 Gallons)

	1943	1944	1945	1946	1947	1948	1949	1950
Jan.	36,085	47,540	52,008	51,746	57,057	61,308	63,083	66,908
Feb.	36,274	47,754	48,856	47,654	50,551	56,487	57,934	63,366
Mar.	41,586	52,263	55,364	56,703	59,947	68,171	73,118	78,739
Apr.	48,177	50,005	59,024	62,111	64,140	72,183	75,279	80,348
May	49,828	54,230	60,748	66,800	70,865	77,186	81,622	89,033
June	53,325	54,266	60,580	63,247	71,329	78,044	83,338	90,010
July	49,867	55,119	66,170	60,076	73,441	81,428	82,118	91,707
Aug.	51,880	55,619	70,058	66,729	72,089	80,351	84,632	94,681
Sept.	49,707	56,318	64,529	62,268	71,384	76,159	80,760	.....
Oct.	53,111	53,154	55,708	66,637	73,277	75,164	79,253	.....
Nov.	50,703	54,967	53,543	61,345	64,158	72,560	76,270	.....
Dec.	48,695	52,250	49,745	61,101	67,506	72,162	75,470	.....
Total	568,238	633,482	696,333	735,417	795,015	871,270	912,877	.....

Source: U. S. Bureau of Mines.

Reclaimed Rubber

(Including Natural and Synthetic)

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude [a]	Exports	Stocks On Hand at End of Period
1936	150,571	141,486	24.6	7,085	19,000
1937	185,033	162,000	29.8	13,233	28,800
1938	122,400	120,800	27.6	7,403	23,000
1939	186,000	170,000	28.7	12,611	25,250
1940	208,971	190,244	29.3	11,347	32,636
1941	274,202	251,231	32.2	13,851	41,750
1942	286,007[b]	254,820	64.6	30,405	42,532
1943	304,058[c]	291,082	59.6	15,678	46,201
1944	260,631[d]	251,083	35.3	11,800	43,832
1945	243,309	241,036	30.2	13,413	28,155
1946	295,612	275,410	26.5	14,461	33,666
1947	291,395	288,395	24.8	14,556	35,943
1948	266,861	261,113	24.4	11,428	32,630
1949	224,029	230,679	22.5	10,637	28,263
1949:					
July	14,626	15,966	22.6	681	29,126
Aug.	17,813	19,297	24.2	612	27,526
Sept.	18,304	18,517	24.2	761	26,257
Oct.	20,683	19,638	23.3	1,107	26,619
Nov.	19,382	18,512	22.1	796	27,801
Dec.	19,723	18,210	21.5	702	28,263
1950:					
Jan.	19,472	20,106	21.4	902	27,319
Feb.	20,474	19,741	22.2	790	27,256
Mar.	23,137	22,151	22.5	988	27,602
Apr.	22,716	21,318	22.2	982	28,352
May	24,879	24,158	21.9	881	27,837
June	25,960	25,253	22.7	889	28,470
July	24,347	23,377	22.2	864	30,371
Aug.	27,548	25,807	22.8	900	31,292

Source: 1936-40, Department of Commerce; 1941 to date, Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (a) Includes natural and synthetic rubber. (b) Includes 893 tons of imports. (c) Includes 67 tons of imports. (d) Includes 21 tons of imports.

Automobile Production in U. S.

(Civilian Production Only)

Year	Passenger Cars	Trucks	Total	Year	Passenger Cars	Trucks	Total
1930	2,784,745	571,241	3,355,986	1940	3,692,328	721,637	4,413,965
1931	1,973,090	416,648	2,389,738	1941	3,744,500	875,381	4,619,681
1932	1,135,491	235,187	1,370,678	1942	220,814	133,083	353,897
1933	1,573,512	346,545	1,920,057	1943	0	4,501	4,501
1934	2,177,919	575,192	2,753,111	1944	0	124,819	124,819
1935	3,252,244	694,690	3,946,934	1945	83,792	313,643	397,435
1936	3,669,528	781,862	4,451,390	1946	2,148,699	930,760	3,079,459
1937	3,915,889	892,382	4,808,271	1947	3,558,178	1,220,634	4,778,812
1938	2,000,985	485,852	2,486,837	1948	3,909,270	1,363,856	5,273,126
1939	2,866,796	704,308	3,571,104	1949	5,108,841	1,123,736	6,232,577
1949:							
Jan.	326,019	104,599	430,618	July	483,261	95,348	578,609
Feb.	324,547	101,700	426,247	Aug.	557,370	99,850	657,220
Mar.	402,402	115,171	517,573	Sept.	534,493	91,389	625,882
Apr.	436,392	106,212	542,604	Oct.	487,891	84,704	572,595
May	394,703	86,200	480,903	Nov.	381,951	72,749	667,881
June	493,882	99,126	593,008	Dec.	285,930	66,688	352,618
1950:							
Jan.	487,824	93,323	581,147	July	595,067	111,028	706,095
Feb.	385,361	89,971	475,332	Aug.	682,782	134,853	817,635
Mar.	469,618	110,843	580,461	Sept.	616,827	105,562	722,389
Apr.	455,193	103,850	559,043	Oct.	.....	.....	.....
May	575,518	120,963	696,481	Nov.	.....	.....	.....
June	720,688	135,332	856,020	Dec.	.....	.....	.....

Source: Automobile Manufacturers Association.
Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

Rim Production

	1945	1946	1947	1948	1949
Passenger Car	4,504,368	15,058,469	21,346,004	23,842,796	27,715,344
Truck & Bus	6,386,652	5,939,244	7,737,353	6,920,231	4,238,174
Agricultural	1,441,909	1,735,992	2,633,699	3,140,882	2,695,430
Earth Mover	1,308	5,520	10,610	13,330	9,895
Total	12,434,237	22,739,225	31,727,666	33,917,239	34,658,843

	1950					
	Apr.	May	June	July	Aug.	Sept.
Passenger Car	2,801,389	2,956,585	3,558,246	3,382,532	3,397,829	3,265,580
Truck & Bus	468,314	562,659	614,415	620,192	586,749	574,479
Agricultural	310,142	266,483	226,468	193,551	288,310	200,334
Earth Mover	476	1,314	2,697	1,041	1,576	2,134
Total	3,080,321	3,787,241	4,401,826	4,197,316	4,274,464	4,042,527

Source: The Tire & Rim Association, Inc.

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(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1938 (total)	**11,516**	**30,567**	**1,049**	**43,132**	**40,907**	**8,451**
Passenger Car.	**10,086**	**27,104**	**580**	**37,770**	**35,789**	**6,937**
Truck and Bus	**1,430**	**3,463**	**469**	**5,362**	**5,118**	**1,514**
1939 (total)	**18,208**	**38,022**	**1,279**	**57,509**	**57,613**	**8,665**
Passenger Car.	**15,742**	**33,471**	**607**	**49,820**	**49,933**	**7,108**
Truck and Bus	**2,466**	**4,551**	**672**	**7,689**	**7,680**	**1,557**
1940 (total)	**22,252**	**35,346**	**1,176**	**58,774**	**59,186**	**9,127**
Passenger Car.	**19,560**	**30,903**	**411**	**50,874**	**50,965**	**7,270**
Truck and Bus	**2,692**	**4,443**	**765**	**7,900**	**8,221**	**1,857**
1941 (total)	**24,780**	**39,895**	**1,489**	**66,164**	**61,540**	**4,436**
Passenger Car.	**19,855**	**34,119**	**586**	**54,560**	**50,392**	**3,165**
Truck and Bus	**4,925**	**5,776**	**903**	**11,604**	**11,148**	**1,271**
1942 (total)	**6,680**	**8,872**	**207**	**15,759**	**15,351**	**6,247**
Passenger Car.	**910**	**2,734**	**38**	**3,682**	**2,790**	**4,432**
Truck and Bus	**5,770**	**6,138**	**169**	**12,077**	**12,561**	**1,815**
1943 (total)	**6,128**	**18,547**	**225**	**24,900**	**20,423**	**1,883**
Passenger Car.	**82**	**10,606**	**71**	**10,759**	**7,620**	**1,132**
Truck and Bus	**6,046**	**7,941**	**154**	**14,141**	**12,803**	**751**
1944 (total)	**6,654**	**26,439**	**263**	**33,356**	**33,446**	**2,013**
Passenger Car.	**208**	**18,330**	**130**	**18,668**	**18,819**	**1,218**
Truck and Bus	**6,446**	**8,109**	**133**	**14,688**	**14,627**	**795**
1945 (total)	**5,984**	**36,479**	**504**	**42,967**	**44,524**	**3,077**
Passenger Car.	**1,115**	**25,463**	**222**	**26,800**	**28,200**	**2,214**
Truck and Bus	**4,869**	**11,016**	**282**	**16,167**	**16,324**	**863**
1946 (total)	**15,310**	**65,490**	**1,512**	**82,312**	**82,298**	**2,448**
Passenger Car.	**11,086**	**54,684**	**653**	**66,423**	**66,466**	**1,763**
Truck and Bus	**4,224**	**10,806**	**859**	**15,889**	**15,832**	**685**
1947 (total)	**25,056**	**62,871**	**3,256**	**91,183**	**95,550**	**6,949**
Passenger Car.	**19,644**	**52,857**	**1,608**	**74,109**	**77,795**	**5,444**
Truck and Bus	**5,412**	**10,014**	**1,648**	**17,074**	**17,755**	**1,505**
1948 (total)	**26,845**	**49,148**	**1,787**	**77,781**	**81,314**	**10,698**
Passenger Car.	**21,589**	**41,295**	**656**	**63,540**	**66,738**	**8,773**
Truck and Bus	**5,256**	**7,853**	**1,132**	**14,241**	**14,576**	**1,925**
1949 (total)	31,584	43,466	1,467	76,517	76,369	10,638
Passenger Car.	28,129	36,440	509	65,077	65,140	8,904
Truck and Bus	3,456	7,026	958	11,440	11,228	1,734
1950:						
May (total)	3,119	5,296	106	8,521	8,629	12,367
Passenger Car.	2,733	4,498	46	7,277	7,369	10,365
Truck and Bus	386	798	60	1,244	1,260	2,002
June (total)	4,056	6,032	114	10,202	8,480	10,762
Passenger Car.	3,605	5,151	48	8,804	7,311	8,987
Truck and Bus	450	882	66	1,398	1,169	1,775
July (total)	3,884	8,049	107	12,040	8,264	7,005
Passenger Car.	3,470	6,899	53	10,422	7,103	5,690
Truck and Bus	414	1,150	54	1,619	1,160	1,314
Aug. (total)	4,093	6,399	117	10,610	8,173	4,801
Passenger Car.	3,647	5,337	56	9,040	6,995	3,836
Truck and Bus	446	1,062	61	1,569	1,178	966

Source: The Rubber Manufacturers Association, Inc.

Cotton, Rayon and Nylon Tire Fabrics

(Production in Thousands of Pounds)

	Cotton				Rayon and Nylon[b]		
	Tire Cord Not Woven	Cord Fabric Woven	Chafer and All Other Tire Fabrics	Total	Tire Cord Not Woven	Tire Cord And Other Tire Fabrics	Total
1947:							
Jan.-Mar.	**21,972**	**49,377**	**21,815**	**93,164**	**5,322**	**52,059**	**57,381**
Apr.-June	**23,491**	**53,746**	**16,480**	**93,717**	**5,486**	**47,360**	**52,846**
July-Sept.	**15,571**	**44,291**	**14,596**	**74,458**	**6,161**	**51,719**	**57,880**
Oct.-Dec.	**18,183**	**48,532**	**17,762**	**84,477**	**6,550**	**55,078**	**61,628**
Total	**79,217**	**195,946**	**70,653**	**345,816**	**23,519**	**206,216**	**229,735**
1948:							
Jan.-Mar.	**18,546**	**50,251**	**19,391**	**88,188**	**a**	**60,569**	**60,569**
Apr.-June	**15,585**	**45,385**	**18,213**	**79,183**	**a**	**59,759**	**59,759**
July-Sept.	29,743	45,927	*c*	75,670	*a*	63,642	63,642
Oct.-Dec.	13,321	34,424	15,879	63,624	*a*	65,258	65,258
Total	77,195	175,987	53,483	306,665	.....	249,228	249,228
1949:							
Jan.-Mar.	*d*	33,213	25,395	56,608	*a*	68,296	68,926
Apr.-June	5,309	29,114	13,617	48 040	*a*	68,269	68,269
July-Sept.	1,343	16,620	11,141	29,104	15,640	55,969	71,609
Oct.-Dec.	180	17,650	11,886	29,716	12,967	58,890	72,857
Total	6,832	96,597	62,039	163,468	28,607	251,424	281,661
1950:							
Jan.-Mar.	3,939	19,210	12,948	36,097	12,469	60,981	73,450
Apr.-June	11,077	29,498	14,071	54,646	11,510	59,966	71,476
July-Sept.	.....	.....	.....	.....	.....	.....	.....
Oct.-Dec.	.....	.....	.....	.....	.....	.....	.....
Total	.....	.....	.....	.....	.....	.....	.....

Source: U. S. Bureau of the Census.
Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics. (c) Included with tire cord not woven. (d) Included with chafer and all other tire fabrics.

Automotive Inner Tubes

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1936	21,514	32,188	721	54,423	57,036	10,945
1937	22,464	29,554	749	52,767	52,373	10,312
1938	11,515	28,134	644	40,293	37,848	8,166
1939	18,190	31,998	1,002	51,190	50,649	7,036
1940	22,172	29,070	972	52,214	52,237	7,017
1941	24,722	33,749	1,232	59,703	57,433	4,686
1942	6,895	7,213	159	14,267	12,685	6,206
1943	6,350	12,474	189	19,014	15,014	2,626
1944	6,460	20,569	196	27,224	27,488	2,813
1945	5,988	33,906	411	40,304	41,742	3,627
1946	15,327	59,357	1,424	76,108	77,251	3,820
1947	25,046	46,560	2,483	74,088	79,181	8,059
1948	26,833	40,548	1,119	68,499	70,033	9,641
1949	31,521	31,450	887	63,858	65,114	10,657
1950:						
Jan.	3,090	2,164	58	5,312	5,629	10,926
Feb.	3,245	2,307	58	5,610	5,803	11,059
Mar.	2,831	2,842	61	5,733	6,223	11,432
Apr.	2,975	3,051	69	6,094	6,285	11,710
May	3,116	3,517	55	6,688	7,089	12,110
June	4,059	4,332	68	8,459	7,537	11,248
July	3,885	5,693	52	9,629	6,916	8,422
Aug.	4,095	5,048	66	9,209	7,244	6,619

Source: The Rubber Manufacturers Association, Inc.

Smoked Sheets–Spot Closing Prices

(New York Market—Cents per pound)

Year	High	Low	Avg.	Year	High	Low	Avg.
1910	288	141	206.60	1930	16½	7½	11.98
1911	184	114	141.30	1931	8⅝	4¼	6.17
1912	140	108	121.60	1932	4¾	2½	3.49
1913	113	59	82.04	1933	9⅞	2⅞	5.96
1914	93	56	65.33	1934	15⅞	8¾	12.92
1915	79	58½	65.85	1935	13¾	10½	12.37
1916	102	55	72.50	1936	23	13½	16.41
1917	90	52	72.23	1937	26⅞	14	19.39
1918	70	40	60.15	1938	17⅛	10⅛	14.64
1919	57	38½	48.70	1939	24	14⅛	17.57
1920	56½	16	36.30	1940	24	18¼	20.10
1921	21¾	11½	16.36	1941	24⅞	19⅛	22.40
1922	28⅜	13⅝	17.50	1942	22½	22½	22.50
1923	37⅛	24¾	29.45	1943	22½	22½	22.50
1924	40⅛	17⅜	26.20	1944	22½	22½	22.50
1925	121	34⅜	72.46	1945	22½	22½	22.50
1926	88½	36¾	48.50	1946	22½	22½	22.50
1927	41¾	33	37.72	1947	25	14	20.00
1928	41¾	17	22.48	1948	25	18	21.99
1929	26⅞	15½	20.55	1949	19¾	15⅞	17.57

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses. Free trading was resumed May 1, 1947.

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market—in Cents)

Average Monthly Price Per Pound

	1943	1944	1945	1946	1947	1948	1949	1950
Jan.	21.34	20.76	22.36	25.49	32.58	36.09	33.37	**31.89**
Feb.	21.61	21.34	22.29	26.57	33.91	33.63	33.41	**32.79**
Mar.	21.98	21.65	22.43	27.52	35.89	35.04	33.44	32.65
Apr.	22.02	21.71	21.88	28.40	35.89	38.10	33.84	33.23
May	21.97	21.63	23.30	28.17	36.51	38.57	33.73	33.64
June	21.92	23.31	23.42	29.89	37.83	38.12	33.56	34.61
July	21.46	22.33	23.27	34.11	38.03	34.89	32.99	38.11
Aug.	21.09	22.11	23.10	36.31	34.83	32.23	32.06	38.93
Sept.	21.10	22.10	23.25	37.59	32.21	31.92	30.94	41.62
Oct.	21.00	22.32	23.85	36.79	32.39	32.01	30.32	40.66
Nov.	20.32	22.13	24.71	31.50	34.50	32.15	30.52	....
Dec.	20.32	22.28	25.21	33.03	36.74	32.90	31.08	....
Average for Year	21.34	21.89	23.25	31.28	35.11	34.64	32.44	....

Consumption of Vinyl Resins

(In Thousands of Pounds)

	Sheeting and Film [a]	Textile and Paper Coating Resins [b]	Molding and Extrusion Materials [b]	All Other [b, c]
1946	52,080	11,673	61,852	27,083
1947	66,430	17,237	73,114	27,064
1948	**98,021**	**31,085**	**73,598**	**21,147**
1949	157,544	29,470	81,842	19,792
1950:				
Mar.	20,676	3,990	9,533	1,989
Apr.	18,675	4,076	9,513	2,068
May	18,692	3,539	9,998	1,648
June	16,740	3,530	9,569	1,506
July	18,868	3,646	8,722	1,688
Aug.	19,389	4,073	8,942	1,878

Source: Bureau of the Census.
Notes: (a) Includes weight of fillers, plasticizers, extenders and safety glass sheeting; (b) Resin content; (c) Includes Adhesives, but excludes data for protective coating resins.

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Rubber Industry Employment, Wages and Hours

All Rubber Products

Mo.	1949 Production Workers (thousands)	1949 Average Weekly Earnings	1949 Average Weekly Hours	1949 Average Hourly Earnings	1950 Production Workers (thousands)	1950 Average Weekly Earnings	1950 Average Weekly Hours	1950 Average Hourly Earnings
Jan.	201	$56.89	37.9	$1.501	187	$60.52	39.4	$1.536
Feb.	197	56.55	37.7	1.500	188	59.90	39.2	1.528
Mar.	194	55.43	37.0	1.498	189	59.70	39.3	1.519
Apr.	190	55.50	36.9	1.504	191	61.76	40.0	1.544
May	185	57.08	37.7	1.514	194	64.52	41.1	1.566
June	181	58.29	38.2	1.526	199	64.35	41.2	1.562
July	177	58.37	38.4	1.520	199	65.46	41.3	1.585
Aug.	180	57.72	38.3	1.507	210	66.39	41.6	1.596
Sept.	167	60.97	40.3	1.513	...	....	...	....
Oct.	187	59.57	39.4	1.512	...	....	...	....
Nov.	186	57.91	38.4	1.508	...	....	...	....
Dec.	187	59.04	39.2	1.506	...	....	...	....

Tires and Tubes

Jan.	91.3	60.72	35.3	1.720	82.6	67.70	38.4	1.763
Feb.	89.4	60.99	35.4	1.723	83.1	67.22	38.3	1.755
Mar.	88.6	61.50	35.8	1.718	83.4	65.26	37.4	1.745
Apr.	88.6	60.92	35.4	1.721	84.0	69.23	39.0	1.775
May	87.2	63.20	36.3	1.741	85.9	74.60	41.1	1.815
June	86.3	64.09	36.6	1.751	87.6	72.00	40.0	1.800
July	82.0	64.45	36.6	1.761	87.4	74.17	40.2	1.845
Aug.	80.9	62.32	36.0	1.731	...	....	...	....
Sept.	64.3	70.03	39.1	1.791	...	....	...	....
Oct.	81.1	64.83	37.3	1.738	...	....	...	....
Nov.	81.3	63.91	36.9	1.732	...	....	...	....
Dec.	82.1	64.79	37.3	1.737	...	....	...	....

Rubber Footwear

Jan.	24.8	51.86	40.2	1.290	20.1	45.87	35.7	1.285
Feb.	22.9	48.15	37.5	1.284	18.8	43.06	34.2	1.259
Mar.	21.9	42.07	33.6	1.252	19.4	51.04	40.0	1.276
Apr.	21.4	46.65	37.2	1.254	19.3	50.36	39.5	1.275
May	20.5	49.45	38.9	1.257	19.1	50.20	39.4	1.274
June	19.8	50.35	39.4	1.278	19.2	52.28	40.4	1.294
July	20.2	48.84	38.7	1.262	19.1	52.35	39.6	1.322
Aug.	20.3	48.78	38.9	1.254	...	....	...	....
Sept.	21.1	51.71	40.4	1.280	...	....	...	....
Oct.	21.5	49.81	39.1	1.274	...	....	...	....
Nov.	22.2	50.51	39.9	1.266	...	....	...	....
Dec.	22.1	50.23	39.8	1.262	...	....	...	....

All Other Rubber Products

Jan.	85.3	54.38	40.2	1.356	84.5	57.04	41.3	1.381
Feb.	85.1	54.05	40.1	1.348	86.3	56.43	41.1	1.373
Mar.	83.1	52.49	39.2	1.339	86.2	56.16	40.9	1.373
Apr.	79.6	51.69	38.4	1.346	87.2	57.13	41.1	1.390
May	77.2	52.51	39.1	1.343	88.8	57.92	41.7	1.389
June	75.3	53.85	39.8	1.353	91.8	55.59	42.5	1.402
July	74.5	54.11	40.2	1.346	92.4	59.81	42.6	1.404
Aug.	78.6	52.46	40.6	1.366	...	....	...	....
Sept.	81.4	56.23	41.2	1.366	...	....	...	....
Oct.	84.4	57.06	41.5	1.375	...	....	...	....
Nov.	82.8	54.04	39.5	1.368	...	....	...	....
Dec.	82.7	55.66	40.9	1.361	...	....	...	....

Source: U. S. Departments of Commerce and Labor.

Note: Data are based upon reports from cooperating establishments covering both full and part-time employees who worked during or received pay for the pay period ending nearest the 15th of the month. The employment series have been adjusted to levels indicated by Federal Security Agency data for 1947, and have been carried forward from 1947 bench-mark levels, thereby providing consistent series. Hours and earning data pertain only to production and related workers.

Production Index for the Rubber Industry

Production 1935-1939 = 100

(Based on man-hours)

	1948	1949	1950		1948	1949	1950
Jan.	223	193	194	July	200	175	221
Feb.	215	188	195	Aug.	207	178	236
Mar.	205	182	197	Sept.	205	174	...
Apr.	200	177	203	Oct.	205	192	...
May	201	178	213	Nov.	203	187	...
June	205	178	220	Dec.	200	193	...

Source: U. S. Department of Commerce.

Sales by the Rubber Industry

(In Millions of Dollars)

	1948	1949	1950		1948	1949	1950
Jan.	271	260	265	July	331	271	454
Feb.	265	251	273	Aug.	331	288	545
Mar.	270	260	293	Sept.	317	272	...
Apr.	285	257	288	Oct.	294	255	...
May	273	248	321	Nov.	291	247	...
June	299	266	350	Dec.	280	245	...

Source: U. S. Department of Commerce.

Rubber Manufacturers' Inventories

(Based upon Book-Value)

(In Millions of Dollars)

	1948	1949	1950		1948	1949	1950
Jan.	608	661	524	July	648	625	501
Feb.	625	661	526	Aug.	641	563	527
Mar.	634	653	532	Sept.	661	538	...
Apr.	625	648	536	Oct.	650	517	...
May	632	650	540	Nov.	667	526	...
June	645	644	544	Dec.	650	531	...

Source: U. S. Department of Commerce.

Various Compounding Materials Consumed by the Rubber Industry

Material	1943	1944	1945	1946	1947	1948	1949
Antimony, Primary:							
Short tons	...	...	...	...	39	41	55
% of total	...	...	...	...	.002	.003	.005
Asphalt [a]							
Short tons	16,510	20,189	19,483	28,715	32,113	19,967	14,050
% of total	.005	.006	.005	.007	.007	.004	.003
Barite (Barytes):							
Short tons	8,000	10,000	10,000	20,000	17,000	18,000	14,000
% of total	3.9	2.9	2.1	4.4	3.1	2.85	2.53
Carbon Black:							
Short tons	236,737	369,015	402,193	470,732	471,790	424,038	...
% of total	90.3	94.6	95.5	95.3	94.3	91.0	...
Clay, Kaolin:							
Short tons	50,964	59,588	109,936	162,393	166,201	176,965	197,341
% of total	5.5	6.8	11.7	12.3	11.5	11.3	13.1
Clay, Fire & Stoneware:							
Short tons	10,259	7,160	7,800	12,951	17,970	15,480	...
% of total	0.2	0.1	0.1	0.2	0.2	0.2	...
Lime:							
Short tons	2,039	5,634	7,170	3,193	589	1,154	...
% of total	0.03	0.09	0.12	0.05	0.01	0.02	...
Litharge.							
Short tons	4,302	3,023	1,864	2,131	2,205	2,835	...
% of total	3.8	2.2	1.3	1.6	1.3	1.8	...
Lithopone:							
Short tons	1,078	726	977	1,607	3,085	4,192	3,245
% of total	0.8	0.5	0.7	1.1	1.9	3.0	4.1
Mica, Ground:							
Short tons	3,063	3,137	3,715	4,951	3,900	12,275	...
% of total	6.0	2.2	7.1	8.0	6.0	19.0	...
Sulfur:							
Short tons	51,000	53,000	64,960	72,800	72,800	70,560	...
% of total	1.8	1.9	2.0	2.2	1.8	1.7	...
Talc [b]							
Short tons	48,994	51,833	63,758*	65,980	71,840	66,226	53,414
% of total	11.8	13.0	16.0	14.4	13.9	13.0	12
Zinc Oxide:							
Short tons	67,898	59,518	63,447	83,776	82,248	82,895	...
% of total	47.4	42.3	49.6	53.1	51.2	54.9	...

Source: U. S. Bureau of Mines.

Notes: (a) Solid and semi-solid products of less than 200 penetration. (b) Includes prophyllite and ground soapstone. * Revised.

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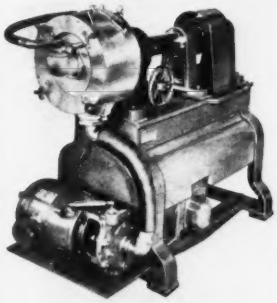

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1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Palmerton Publishing Company, Inc., 250 West 57th St., New York 19, N. Y.; Editor, M. E. Lerner, 250 West 57th St., New York 19, N. Y.; Managing Editor, None; Business Manager, Peter P. Pinto, 250 West 57th St., New York 19, N. Y.

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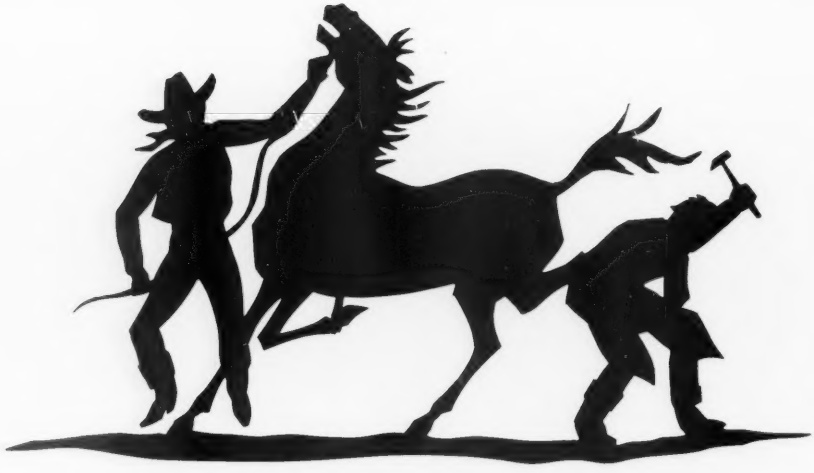

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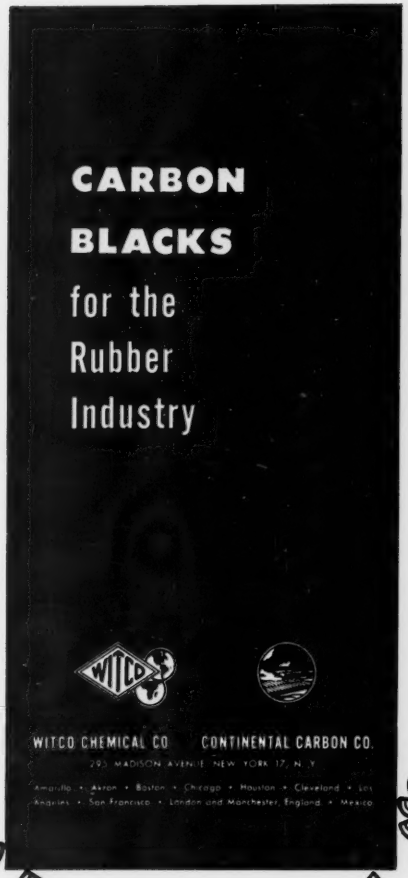
THIS HANDY, COMPACT, LITTLE BOOKLET—

- covers both types of rubber blacks, channel and furnace
- lists 62 trade names of various grades of channel and furnace blacks used by the rubber industry
- lists the manufacturers of these channel and furnace blacks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